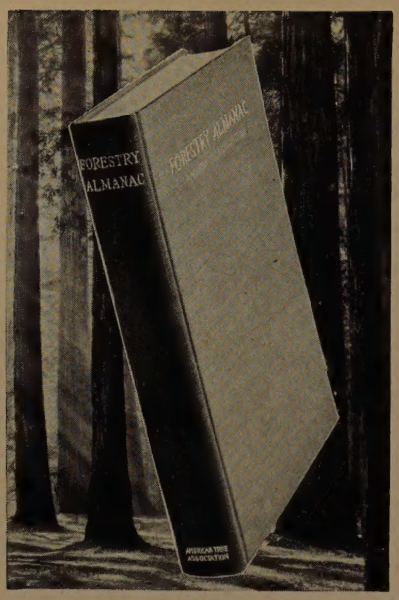
NATURE MAGAZINE

JUNE 1933 35¢ VOL. 21, NO. 6



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Nature Lovers' Resort

In the Harlem Valley in Dutchess County, New York, Leon L. and Edith Allen have established a resort for Nature lovers and, appropriately, have called it "The Allens." And that it may be a really worthwhile contribution to Nature knowledge, a Nature training course has been worked out in cooperation with Dr. Bertha Chapman Cady and the Coordinating Council on Nature Activities. Two two-week courses are planned, being from June 17 to June 30 and from July 2 to July 16. Full information can be obtained from The Allens, Dover Furnace, New York, or from Dr. Bertha Chapman Cady, 570 Lexington Avenue, New York City.

Preserve Giant Cactus

To preserve representative desert flora, notably the saguaro or giant cactus, the Saguaro National Monument has been established in Arizona. The reservation comprises about 60,000 acres, mainly within the Coronado National Forest, on the slopes of the Santa Catalina Mountains about twenty-five miles northeast of Tucson. The Forest Service will administer the area.

A Week for Dogs

The week of October 1 to 7 has been set aside as National Dog Week, a movement headed by a committee with offices at 3323 Michigan Boulevard, Chicago. The object of the week is to foster better dogs, better care for dogs, fair and just laws for dogs and to further wider ownership of dogs. The committee has announced two prize contests, one for the best sticker or poster for the 1934 campaign and one for the best dog photographs.

Quoth the Raven

The March issue of *The Raven,* mimeographed publication of the Virginia Society of Ornithology, devotes its entire issue to an interesting history of Virginia ornithology. It is by Dr. James J. Murray, president of the Society, and copies may be obtained for twenty-five cents from Dr. Florence Hague, Sweet Briar College, Sweet Briar, Virginia. Copies of Dr. Murray's paper entitled "Additions to the Virginia Avifauna since the Publication of the Rives Catalogue, 1890", and reprinted from *The Auk,* are also available at twenty-five cents.

Flora of the Rockies

Plants of Rocky Mountain National Park has recently been published by the National Park Service in a fully illustrated, nicely printed, paper-bound book of 157 pages. It is the work of Ruth E. Ashton and is an invaluable guide to the flora of the region, not only of the park itself but the mountain regions of Colorado. An excellent index, a bibliography and a glossary give this work added value. Copies are available from the Superintendent of Documents, Government Printing Office, for 25 cents each.

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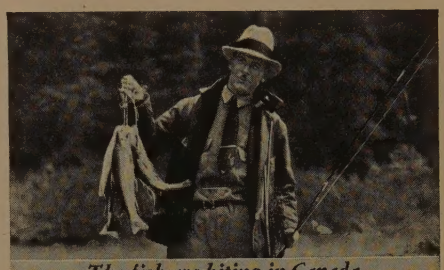
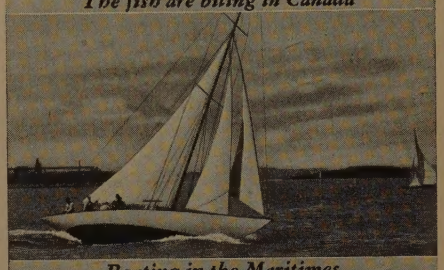
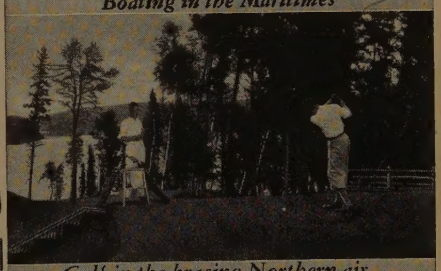


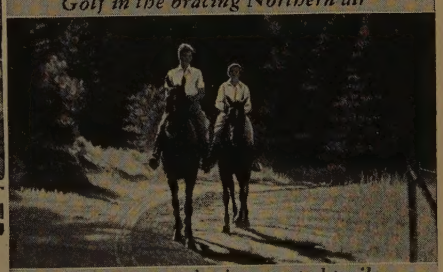
The fish are biting in Canada



Boating in the Maritimes



Golf in the bracing Northern air



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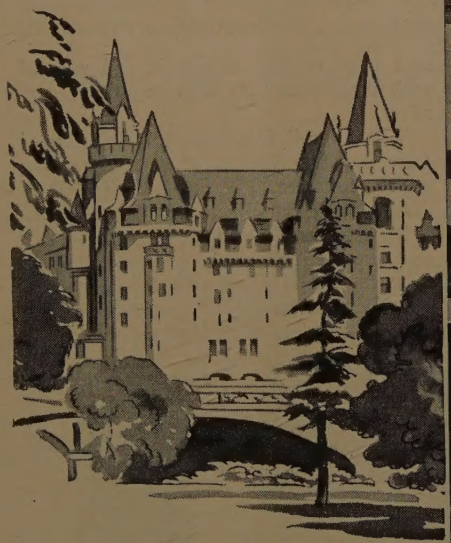

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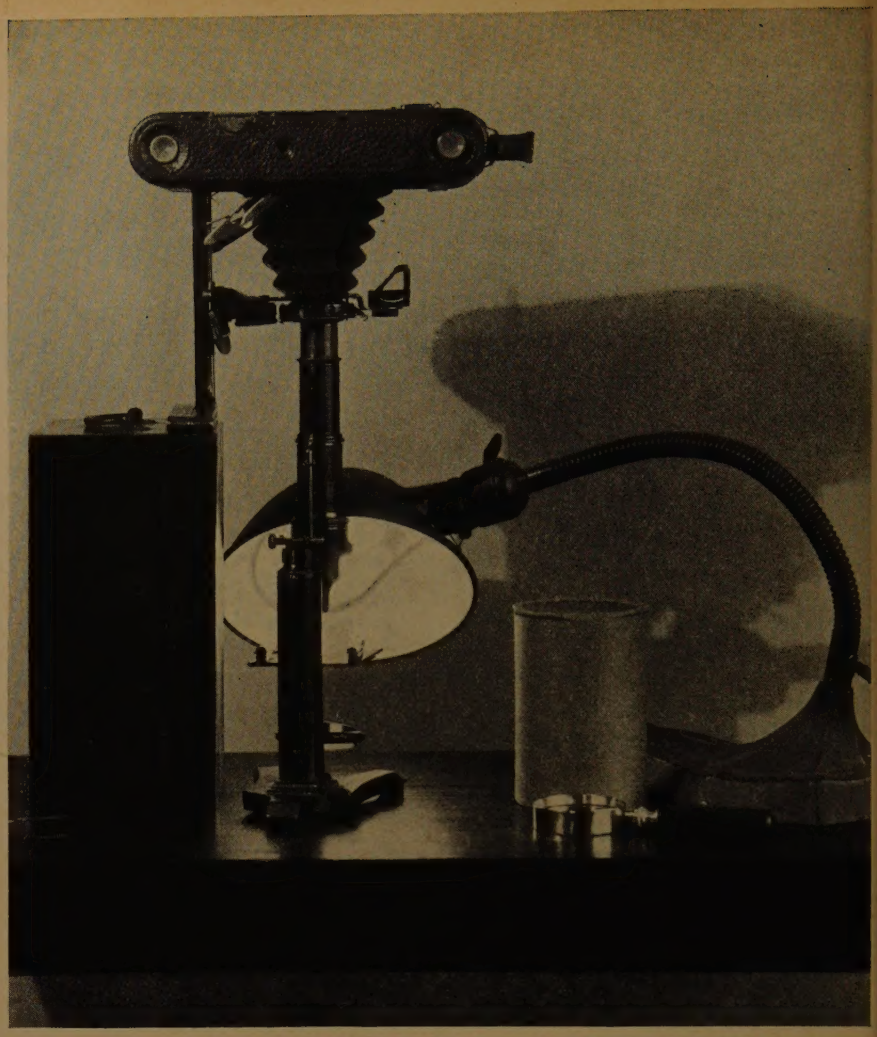
PHOTO-MICROGRAPHY FOR THE AMATEUR

By HUGH SPENCER

PHOTO-MICROGRAPHY, or the photographing of microscopic objects, seems to be generally regarded as a pursuit open only to the scientific worker with special training and elaborate and expensive equipment. Comparatively few amateurs know that with an ordinary camera or kodak and any reasonably good microscope, they can enhance their collections of photographs by making pictures of various microscopic objects. And it is not at all complicated or difficult. The equipment needed, aside from the camera and microscope, is simple and easily made.

The microscope should be of the compound variety with rack and pinion for focussing and a substage mirror for use in viewing the object by transmitted light. Almost any camera may be used. The microscope should first be adjusted in the ordinary way with a suitable subject on the slide; one that can be viewed by transmitted light is best for first experiments. The light should be fairly brilliant, a 75 or 100 watt lamp placed three or four inches from the mirror is suitable. The mirror should be adjusted to project the maximum amount of light into the lens.

If the camera is of the type having a ground glass for focussing it is only necessary to remove the lens or lenses and place it in position above the microscope with the shutter fitted over the eyepiece of the microscope, then, if the light is sufficiently brilliant, an enlarged image of the object on the microscope slide will be seen on the ground glass of the camera. By adjusting the focussing screw of the microscope we can bring this image into sharp relief. In other words we have substituted the lens of the microscope for the lens of the camera and that is about all there is to it. If we fix the camera firmly in position we can put in a plate or film, expose it, and proceed with development as with any other negative.



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When a roll film camera is to be used there are two courses of procedure that may be followed. The first and simplest of these is to set the camera with lens focussed at infinity (100 feet on the focussing scale) and suspend it above the microscope which must be properly adjusted for visual inspection. The lens should be well centered over the eyepiece of the instrument and the camera firmly supported. Then make the exposure. It's as simple as that, yet some excellent results may be obtained in this way. It should be noted that with this method the camera is used *with the lens.*

In the second method we use the camera without the lens. As our camera is not equipped with a ground glass for focussing we must make a viewing or focussing tube. This may be either a rectangular or a cylindrical tube of cardboard. The diameter should be not less than the width of our film; the length, this is important, exactly the length of the camera from the face of the shutter where it will rest on the eyepiece of the microscope, to the plane occupied by the film. The inside of this tube must be black, black cloth or paper may be used as a lining. To one end of the tube attach a piece of ground glass with the ground side in or toward the tube. The other end should be closed except for a hole in the center just a little larger than the lens in the eyepiece of the microscope. This tube is really a simplified camera for the purpose of obtaining the correct focus. By placing this with the small opening upon the eyepiece of the microscope we can see the image of our object on the ground glass, and, as with the plate camera previously mentioned, by adjusting the screw of the microscope we obtain sharp definition. The image on the ground glass will be seen to best advantage if a focussing cloth or hood is used to exclude all light except that which comes through the lens.

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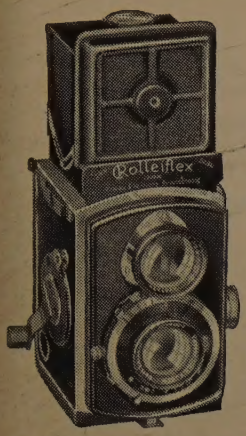

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When the correct focus has been obtained the tube may be removed and replaced by the camera from which the lens has been removed. We will assume that the film is in position and the shutter set at "time". Some support will undoubtedly be needed to hold the camera in position, and care should be taken to see that no light can enter between the eyepiece of the microscope and the face of the shutter. It may be necessary to provide a felt gasket for this purpose, or, in some cases, a sleeve of black paper may be used. The camera diaphragm is best left wide open or at least no smaller than the lens of the eyepiece.

We can now open the shutter, expose the film, close the shutter, remove the camera and turn the film along ready for the next exposure. Accurate and careful focussing for each change of subject is essential for good results. A hand magnifier is sometimes helpful in observing detail on the ground glass.

The method described will produce a dark image on a light ground, or, if the object is sufficiently transparent, an X-ray effect. Dark ground results may be obtained by shifting the light, after focussing, to fall directly on the subject, and placing a dark cover over the mirror. The exposure in such case will need to be twenty or thirty times that given with transmitted light. Other effects may be obtained by using white or gray grounds back of the object. The beginner will do well to confine himself to low power work, at first, and to subjects that can be studied by transmitted light. The focussing of opaque objects is extremely difficult unless a powerful light can be concentrated on the object.

The exposure required depends upon many factors—the volume of light and its distance from the object, the nature and color of the object, color of ground and speed of plate or film. A careful record of each exposure should be kept, and, by using always a uniform and constant light source it will soon be easy to obtain correct exposures.

The field covered by the lens of the microscope is circular in form and the photomicrograph can only be made square or rectangular by cutting off part of the field. The ingenious amateur, if his camera is of the folding variety, will find the exact extension of his bellows to produce an image of the field the same width as his film, and will lock the camera in this position and make his focussing tube to correspond. He will find, because the exposed portion of his film is circular in form, that he can make ten or twelve exposures, instead of eight, on the regular 8 Ex. film. If an autographic kodak is used this may be accomplished by attaching a long strip of thin black paper to the spool when loading and allowing it to pass out through the autographic slot. This may then be marked into spaces of any desired length and used as a guide when rolling the film. In this way the film is used with the utmost economy.

In this article it is not possible to go into the more technical details of photomicrography. This is really only an introduction to the elementary aspects of a large subject. I have tried to open the door into fields that are filled with strange and fantastic forms, fields that are unlimited in extent with many trails and few signposts.

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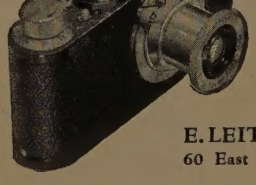

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PRESIDENT LOOKED TO AS LEADER IN SAVING NATURAL RESOURCES

• • •

For the first time in more than twenty years we have in the White House a man whose interest in conservation is more than academic. This statement may be challenged. Partisans may point to the fact that during the last twenty years we have seen tremendous strides forward in the setting aside of National Parks, in the extension of the National Forests and in the general expansion of the conservation activities of the Government. This is true, but at the same time we have seen increasing inroads into the numbers of our game birds and fur-bearing animals. We have seen successful raids upon our publicly-owned natural resources by power interests, oil promoters and other special groups.

Such progress as has been made in conservation has too often suffered by the lack of leadership on the part of our more recent Presidents. That which has been accomplished has come, we feel, by virtue of the growth, militancy and activity of conservation groups. Indicative of the popular education done is the distribution of four million Forestry Primers to the schools of the nation by the American Tree Association. Progress has been aided by mechanical changes that have brought many millions into wider contact with the outdoors and enabled a far more effective public education as to the importance of these invaluable natural resources. And there is yet another factor to which much of this progress may be credited. It is the tremendous impetus given to popular Nature interest and conservation by Theodore Roosevelt.

We are confident that Franklin Delano Roosevelt will carry on the conservation tradition of the family name. This confidence arises both from what the President has said and done, and from his very character. Perhaps the last should be first, because it is the action and the direction of that action that reflects the background and convictions of the man.

Mr. Roosevelt is a man to whom the full life means much. No well-rounded interest can ignore Nature and that which makes Nature of vital significance and importance, and we have ample evidence that the President's interest is notably varied. Mr. Roosevelt has suffered, fought and conquered. No man whose life contains such a lesson in fortitude can lack sympathy for the struggles of man and beast.

On the action side, Mr. Roosevelt has especially indicated his conservation interest in the field of forestry. While a member of the New York Senate from 1910 to 1913 he was chairman of the Conservation Committee and was instrumental in passing several important measures. As Governor of New York he was the leader in a notable forestry program for the State and champion of the State forest preserves against exploitation for private profit. As an individual at his Hyde Park home he has practised forestry and reforestation. In his acceptance speech in Chicago and during the campaign, the President left no doubt of his appreciation of the vital importance of adequate forest resources and their proper conduct and conservation.

As tangible evidence of this conviction a quarter of a million young men are now being concentrated in forestry and conservation camps in many parts of the country engaged in a wide variety of projects, all of which contribute to forest improvement. This is, to be sure, primarily an economic measure to provide unemployment relief. But that it is directed to forest betterment and not into other possible channels of constructive endeavor is significant.

So, during the Roosevelt administration, we may be certain that the friends of the forest, the National Parks and other natural resources will find not only a willing ear but an understanding heart in the White House. They will find a man who has declared himself as a firm believer in country planning just as much as in city planning.

During the next four years there will be problems concerning the protection and preservation of wild life. Final responsibility in many of these matters is vested in the President of the United States. In periods of emergency he may order longer closed seasons. He has definitive powers under the Migratory Bird Treaty Act. He has the opportunity to assume a place of leadership in wild life preservation. For many of our most beautiful and interesting species, the next few years threaten to be the zero hour. Those acquainted with the problems of conservation in this field are confident that with "F.D." as with "T.R." there will be a new deal.

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NATURE MAGAZINE

VOLUME 21 JUNE · 1933 NUMBER 6

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SPRINGTIME IN A BOREAL BIRDLAND

THE TUNDRA RINGS WITH SONG WHEN JUNE ARRIVES

BY OLIN SEWALL PETTINGILL, JR.

PHOTOGRAPHS BY THE AUTHOR

SPRINGTIME! Suddenly it comes to the frozen tundra of the North Country, transforming it into an exuberant garden. Over-night it breaks in upon the stillness of a seemingly endless winter with voices from ten thousand throats. Like magic, its warming winds and increasing daylight bring forth myriad flowers and carpets of highly-colored mosses in the path of the retreating snow. Such is springtime in the Arctic—brief but luxuriant!

To Churchill on the mid-west coast of Hudson Bay this typical spring comes to create for a short season a unique birdland. Unique, indeed, because here in a comparatively short radius of twenty miles the last stand of timber meets the barrens of the North; here a coastal, sandstone ridge slopes to the broad plains of the interior where various channels run from shallow ponds to mud-bordered streams; here, in short, is a merging of what scientists term the Canadian, Hudsonian, and Arctic Life Zones. Thus, water-birds and shore-birds find territories suited to their needs of existence together with the birds preferring the barrens, the scrub thicket, and the woodland. Imagine, then, the hustle and bustle of springtime when more than a hundred different kinds of birds, mutual in their desire for a northern home, make their appearance out of the southern horizon undefeated by peril or weather!

THE STILT SANDPIPER

One of the numerous company of shorebirds that rear their young in the far North

Spring is in possession of Churchill by June. The V-shaped squadrons of Canada geese that only a short while ago manoeuvred northward across the spring skies of the South have dissolved into pairs and some are choosing their nesting grounds along the grassy banks of secreted ponds. The male snow bunting has returned, bedecked in his courting attire of black and white. No longer is he the sober brown-white harbinger of winter, always at the will of blustering winds and whirling blizzards. Now he is a versatile songster, a modest lover. Yet Churchill will never satisfy his innate idea of a place for home. No semiarctic for him! Only after he and his kin have gone farther to the north will he be content. So, merrily he will disappear as he appeared.

From the thickly-branched spruces of the inland come the sibilant voices of the trim little black-poll warblers. Were it not for their whispers and occasional darts from the hidden trunks of one feeding tree to another, little would the romance of their arduous journey from South America be appreciated. Through the rich tropical rain forests, across the landless stretches of the Caribbean Sea, and onward over lands beckoning with the vernal life of May and June, they have wended their way to their cherished habitat of the wind-swept evergreens.

Along the extensive mud-flats of Churchill River

MORE COMIC THAN ESTHETIC IS THE STRUTTING OF THE COCK WILLOW PTARMIGAN
This grouse of the barrens is specially dressed for the occasion of courtship with rich chestnut neck feathers added to his otherwise winter plumage

legions of shore-birds mill about. Their migration is at its peak and they are stopping off for a little recuperation and food. The numbers are constantly in a state of fluctuation because some, such as turnstones, are departing on their hastened trip to the northward, while others, like the black-bellied plovers and Hudsonian curlews, are arriving, some to scatter over the surrounding tundra to become elements of this glorious springtime. In concert, flocks of these gathered shore-birds rise and wheel, picking up numbers as they go. There are mixed flocks with conservatively marked white-rumped sandpipers and roly-poly semipalmated and least sandpipers and separate flocks of gayly plumaged red-backed sandpipers. In erratic swings they display first their white bellies, then their strangely mottled backs. At the same time there is a whir of rapid beating wings as a flock of stilt sandpipers, with their handsomely barred breasts, check the momentum of their downward descent to the tempting border of a tidal slough. More flocks settle nearby. Now all run hither and thither to test the ill-smelling mud with their sensitive bills. Busily, hurriedly, they work as if time were pressing. Some make the most of their long featherless legs by wading into the water as far as their courage permits them. Frequently an individual pauses to check over a few misplaced feathers on the wing or to rearrange a few bothersome ones on the breast. Perhaps, following this, it tucks its bill and forehead under the scapulars of the back, draws one leg up under the body, and takes a nap. Suddenly out of a clear sky comes the terrifying swish from the scimitar-like pinions of a duck hawk as it dashes into their midst in quest of shore-bird quarry. Then the assembled hundreds, forgetting the flocking habit, flee in every direction.

Bird song becomes an outstanding contribution to the vivacity of this northern season. From the expansive tundra and the sky above it, from the coast and not far distant bush, it emanates in varied strain. The tops of the stunted willows are singing perches for innumerable tree sparrows. To be sure they are accomplished songsters. Not so for the omnipresent savannah sparrows! Their best utterance is a ridiculous buzz. But the refined music makers, the real bards of this birdland, are the northern relatives of the white-throated sparrow—the white-crowned and Harris's sparrows. It would seem that the ability to produce whistles with a plaintiveness of tone runs in the genus of *Zonotrichia.* Undoubtedly there is a decided similarity among them. Yet no song is more striking than the mellow, monotone whistle of the Harris's sparrow. Springtime here, too, has its rain carol. It comes from a dark plumaged robin with a deep russet breast, probably one who was hailed as the "first robin" in the lands to the south because he, being a

THE SPRY LITTLE SEMIPALMATED PLOVER
It can dart about, bat-like, on stiffened wings, saying "kiuk kiuk" in an effort to attract and win the lady of its choice

boreal bird, was the first of his kind to migrate northward. Bell-like thrush notes are never lacking because they issue from the speckled throat of the gray-cheek—recluse of the densest evergreens. All these singers are characteristically dwellers of wooded territories.

In contrast to them are the singers of the treeless prairies and barrens, birds such as the horned larks, Lapland longspurs, and pipits. They are, generally, flight singers. It is an interesting fact that birds living in areas void of high places such as trees resort to the wing as their means of making themselves conspicuous when singing. Of course, the tree sparrow takes to the highest scrub willow, or the white-crowned sparrow to the summit of a rock when inclined to sing. But in a country such as this, where often there are no objects protruding abruptly above the level of the ground, the flight singers can go the birds of the tree zone one better. Thus a Lapland longspur, on rapid beating wings, mounts skyward until he reaches a preferred height where he sets his wings and glides earthward, giving forth a succession of rollicking notes. Similarly the pipit along the sea coast, once at the zenith of his aerial tower, volplanes back to the starting point with calls less gushing, with more of a soft, melodious chippering. When the Hoyt's horned lark desires to sing, however, the matter of being on the wing or on *terra firma* is of little consequence. Wherever he happens to be he starts bursting forth with a succession of tinkling sounds. On the ground he often continues them without interruption for

THE LEAST SANDPIPER
Scarcely larger than a sparrow, this shore-bird is easily the smallest of its kind in the North Country

HOYT'S HORNED LARK
Whether on the ground or the wing, it bursts into tinkling song

THE BONAPARTE GULL
With Arctic terns, it comes from their selected inland territories

over a minute, seeming never to take a breath. He fluffs out his body feathers and vibrates his wings, as if putting every atom of effort into the success of that one conglomerate song.

Although bird song contributes largely to the seasonal activity, the spectacular flight performances of the innumerable shore-birds which will nest here are more characteristic of this bird-land. With this group of birds the ability to do remarkable stunts on the wing is more important than brilliancy of vocal sounds in the quest of a mate. The spry little semi-palmated plover darts about bat-like on stiffened wings, and he who most ably says, *kiuk kiuk*, is the most likely to win the lady of his choice. So, too, the tiny least sandpiper flies with down-curved wings and, in rhythm with their rapid beating, trills most tunefully to earn desired admiration.

All shore-birds have something individual in the way of aerial displays, and nowhere is it more in evidence than on the northern tundra. The winnowing sound produced by the air rushing through the stiffly held tail feathers of the Wilson's snipe as it shoots madly through the sky, the flute-like calls of the lesser yellowlegs given simultaneously with a simple wing action, and the clever manipulation of both wing and voice of the exquisitely plumaged Hudsonian godwit are in themselves unequaled.

On the surface of grass-bordered lakelets a romance goes on among the dainty northern phalaropes. There is no elaborate aerial exhibition, no effusiveness of voice as in other shore-birds. Females with the bright colored plumage wage the conquest of love, not the males. Coquettishly they approach their stoical suitors circling them with bowing heads and nervous dippings of the beak. The dull colored males nonchalantly continue with their feeding, whirling dizzily along the shallow parts and paddling at the same time with their lobate feet in order to stir up what minute animal life may be present for food. As soon as some edible tidbit is discovered, down go their heads in pursuit of it. All manner of expression failing so far, a female desperately shoots into the air for two or three feet making a sharp drum with her wings before dropping back to the surface. This effort to gain attention seems to have no effect. Another female plumps down on the pond, perchance, and a furious chase immediately ensues. The bachelor of her choice, indifferent though he may be, is to be hers at all cost. And so fate has it that the male sooner or later falls a victim to her pressing affections. Little does he realize what fate has in store for him when that conquest is made. Doubtless he remains unheedful of the fact that it will be up to him to incubate the eggs and raise the family while his once persuasive wooer enjoys club life on ponds far

HARRIS'S SPARROW
It shares with the white-crowned sparrow distinction as a real bird bard of the Northland springtime

away, shirking maternal duty with no thought of young.

Far more comic than esthetic is the strutting of the cock willow ptarmigan, grouse of the barrens. He is specially dressed for the occasion of courtship with rich chestnut neck feathers added to his otherwise white winter plumage, representing a stage transient between the winter plumage and the red-brown body plumage of summer. What arrogance, what pomposity he uses as devices of attraction! Ardently inclined, a cock moves rigidly forward like one unused to formal attire. In fact, he holds his head in one position as if his neck were involuntarily bothered by a starched collar. Straight ahead he goes with his scarlet combs elevated above the level of his brow. Should a tree happen to be in the way, he slams into it blindly. Yet he steps aside casually as if his powers of concentration had made him unaware of the collision. At the slightest provocation he roars into the air on his short, rounded wings, lets loose with a multiplicity of raucous cackles, and then alights a short distance away to continue his clatter with several impudent calls sounding not unlike *go back go back go back*. A steeply inclined ledge happens to be in the way as he continues. Precisely and deliberately he places one feathered foot in front of the other until the ascent is accomplished. Presently he faces the descent, equally as precipitous, but what is more, wet and slippery. Never hesitating, using the same precision he starts down. For three steps he retains his dignity, but on the fourth he is sent sliding downward, sitting back on his tail. Yet, never batting an eye, he picks himself up and keeps on, straight ahead!

In the second week of June the ice along the coast yields to the mild southwesterly winds. Miniature white islands come into being. The deep green channels which appear between them become at once the feeding grounds for varieties of water-birds. In the late afternoon especially come fast moving flocks of old-squaw ducks swinging merrily along, spreading and clustering, finally to splash upon the rippled surface. Happy-go-lucky, full of energy, they begin paddling about in all directions, plunging one after the other into the cold depths and returning briskly. Males with their long nuptial tail plumes bow in splendor before their less gayly arrayed inamoratas. With silky necks arched, they bring their white-faced heads first to the level of the water and then quickly up and over the back until they almost touch the rufous edged scapulars. On a clear evening, when all is beautified by the glow of the sun concealed under the northwestern horizon, these ducks can no longer be seen. The ice chunks in the Bay, borne about by tide eddies and breezes, become moving masses of color. Their jagged edges and the amassed pinnacles of snow form supernatural objects, amazing in design. From the dark, apparently bottomless chasms which separate them, come the calls of the old squaws, resonant and clarion-like. How unbelievably they harmonize with the tranquillity of this northern spring evening!

On other days when the season's progress is interrupted by a blustering storm from the northeast, when the ice of the Bay is driven into a groaning mass along the coast, migrant water-birds still continue to appear for feeding purposes. Heavy bodied American and northern eiders may be seen arriving, flying steadily into the teeth of the gale. Just above the crested surges they appear; now they are hidden behind them. Soon they clumsily alight on the turbulent surface. Dark plumaged male scoters with their colorful bills as their chief source of vanity swim along with their flocks near the shore. Little do they mind the inclemency of the weather because they are half of the time submerged in quest of food. Occasionally a red-throated loon feels that all is safe to stop off for a while. For the most part he is hidden among the troughs of the outer waves.

To this same vicinity Arctic terns and Bonaparte's gulls come from their selected territories of the inland. But they secure their food only after searching tirelessly from the wing. Back and forth, back and forth they go until, mayhap, an Arctic tern discovers a school of fish. By the quickened strokes of his wings he remains stationary in mid-air above it for a moment. Then, once selecting his prey, he dives after it, hitting the water with the force of a plummet. Several moments elapse before he finally climbs into the air with his silvery catch crosswise in his beak. Thereupon the fun begins. Other gulls and terns who have witnessed his successful plunge gather from all directions to try their luck. By twos, threes, and fours they begin diving into the school. Suddenly a dark cloud in the form of a dusky hawk-like bird appears in their midst spreading pandemonium. This is a parasitic jaeger coming for no other reason than to secure a meal. The ages have developed in this true gull a peculiar method of securing a living which differs markedly from that of any other of his scavenger relatives. His arrival is meant to spread panic so that these fishermen, frightened by his unexpected appearance, will drop their prey which will be his for the catching. No bloodshed, of course, occurs since the jaegers wish to do no harm to their food getters. Even so, there is no hesitation on the part of some gulls and terns in dropping their fish, while others offer bold resistance. For instance, witness the case of a Bonaparte's gull arising from the water with a small fish when it is discovered by three jaegers. Imagine, too, the bird's feelings when they come rushing at it, like bad boys, from different directions. The gull summons all strength to forge away, but escape is impossible. It is checked in front by one, from below by another, and nearly struck with the hooked beak of the third. In the face of such opposition the harassed bird drops its prey, presumably reasoning that a gnawing appetite is preferable to such annoyance. The fast falling fish becomes the booty of three winged pirates who go after it with somersaults and swoops until it disappears without division down the gullet of one.

The last of June finds spring coming to an end at Churchill with the northward migration over, with the sun setting for only a few hours, with the climate remaining mild from day to day. The tundra continues flowering, changing colors almost daily with the rapid

succession of blooms. Above it various butterflies dance. Orchids are blossoming along the gravel-bottomed rills, and many of the small shrubs in the glades of the evergreen woodlands have flowers. Dragonflies whisk over the richly vegetated marshes and small ponds, the bottoms of which remain forever of ice. The birds are selecting their nesting territories and loquaciously proclaiming their domains. Only too soon will there be the excitement of domestic cares and the subsequent southward migration. Yes! This is the springtime which flushes from the frozen barrens of Churchill and the birdland which it suddenly creates as the icy hand of Winter loosens.

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FROGS IN SPRING

BY R. BRUCE HORSFALL

WITH ILLUSTRATION BY THE AUTHOR

THE DAY was warm and still; no wind stirred the branches of the budding trees. Quite the balmiest day of a week of sunshine and showers, and the very first warm days after a long, cool, though not hard winter. We were sitting by the side of a small permanent waterhole where the first signs of spring were in evidence in the form of the little frogs, *Hyla crucifer,* and wood frogs, *Rana sylvatica.* The medley of sounds was quite deafening and recalled to mind the quacking and clacking of a colony of great blue heron chicks.

The wood frogs were sprawling about in numbers and in every conceivable position on the open stretches of water and where the fallen leaves filled the pond to the surface. With heads poked out they were vying with each other in croaking the loudest possible. It was "Qwak rak rak" all over the pond, interspersed with the shrill deafening pipes of a few hylas.

Where is that particularly loud hyla; is it across the pond or at our feet? Anything making a sound of that intensity ought easily to be found. And that other one falling like an echo behind the first, sounds muffled, doesn't he? Must be under a leaf or a stick—and that third one—there he is, plain as the nose on your face. There where the sun strikes on his ballooning throat as it contracts and stretches, contracts and stretches. Now that we have found one, the others come to light—easy when you know what to look for.

Pitter patter pit, across our feet hurries another tiny form—and then another just behind us. As of raindrops upon the forest floor, the leaves are all arustle with their eager little bodies hurrying to the trysting place. Down the banks ahead of us—across the flat land behind and from the hill beyond they scurry. With happy croaks they hit the water and rest.

A few yards away was another pond whence came a sound for all the world like a flock of trilling canaries outsinging each other. We hurried over. Numerous tiny gray frogs, *Pseudacris feriarum,* like miniature wood frogs, were meeting there and had their orchestras in full blast—momentarily augmented by others coming in from all directions. A few wood frogs included their regulated pipings, marking time.

We found wood frog egg masses a-plenty but looked in vain for those of the hylas—perhaps we were too early—the morrow will be a different story. This was March 26, 1928, and the season was belated by a full month.

We were there primarily to collect salamander eggs usually laid in the month of February and although we saw several adult *Ambystoma maculata* come up to breathe, we found only one jelly mass, presumably of that species, attached to a twig. About six cubic inches of brownish-coated jell contained seventy eggs, each in its own whitish spherical envelope.

As we left the place all those glad little voices were piping their loudest "Spring, spring, spring has come. Spring, spring, spring." And it was true, the cold wet spell was over. Spring had come and come to stay.

PHOTOGRAPH BY KILROY HARRIS

THE CAMEL IS NEVER REALLY TAME BUT IS VERY STUPID

That is why it can be managed so easily and why everyone thinks of this beast of burden and ship of the desert as a domesticated animal

LESSONS OF THE WILD

SOME AMAZING WHYS AND WHATS OF NATURE

BY WARREN E. COX

LOVERS of animals all too often confine their interests to a few kinds which they know well and understand. A man who learns the language of the eye, the ear and the tail of his favorite dog, as well as that spoken language which is so surprisingly extensive in most so-called "dumb" animals, feels the thrill of a sort of secret understanding; he senses that things can be said which cannot be put into words; he partially realizes that he has been admitted, through his understanding of one animal, into a larger fraternity of them all. Such a man is likely to lose some of his feeling of superiority over his animal friends and may come to know that they, after all is said and done, are often, with their less top-heavy development of gray matter, as well fitted for their present-day environment as is he himself for his. It may be that he has clever hands with which he can fashion tools that do him good or harm, but certainly his nose, his eyes, his ears and his general sensibilities are poor affairs, telling him little if anything as to who has preceded him on his path, what that slight movement was in the foliage, or what step approached in the dark. He has lost the acuteness of his senses because they are no longer so necessary to him. But a man who understands even one animal is a much wiser man, and the understanding of one is likely to lead to the understanding of others, for one pet dog leads to another and dogs may lead to raccoons or coatis or even cheetas, given the right conditions.

In this article Mr. Cox touches on a few of the interesting and amazing things in Nature, many of which will, perhaps, surprise you. The points he makes are all true and of a sort that makes the study of wild life a source of endless fascination. The material was gathered in connection with preparing a new Nature book.

PHOTOGRAPH BY H. ARMSTRONG ROBERTS

WHAT ABOUT A KANGAROO'S LEGS?

Young kangaroos have longer forelegs than hind legs, although the hind ones must later be the longer

If I were a rich man and could endow a school for children, I would most certainly include facilities for the keeping of all the pets that children might want, and I would have practical courses in the proper raising of everything from goldfishes to ponies, nay from canary birds to baby lions. Children should learn about the life they are being fitted for in this world from their animal associates. The baby who plays with a kitten learns a reasonable consideration for his small playmate through experiences with claws. The child who has lost a loved friend, be it dog or cat or canary bird, knows something of death. Mother love can be developed in the heart of a little girl by letting her have a mother dog or cat as it could not be by the giving of a hundred dolls.

Parents will find real Nature study includes more amusing and far more profitable stories which they can tell their youngsters than those of the three bears and other animal fairy tales. In order to give an idea of the tremendously interesting ma-

PARENT GREBES CARRY THEIR YOUNG ON THEIR BACKS

And what do you suppose they do when danger threatens? They take the youngsters under their wings and dive with them

terial in the study of Zoology, I am going, first, to ask some conundrums and tell some stories concerning the almost unbelievable things which birds and mammals are and do. If you have younger members in your family, try some of these on them, then start them digging out similar facts for themselves. It is a great game, well worth the playing.

What type of animal is it that can be from four to a hundred feet long, has five fingers on each hand but no nails, nourishes its young with milk, has hind legs which you cannot see, once had a hairy coat but has discarded it, is sometimes colored blue and has its nose to all appearances above its forehead? You have perhaps guessed it but did you know that some authorities say that it never sleeps? And, by the way, did you know that elephants may be born with a nice coat of gray fur, and that they walk on the tips of their fingers and toes and have teeth which travel from the back of their mouths to the front using up about a yard of solid tooth in a life time? A grizzly bear is a strange chap and we think of him as very large. In point of fact he is only two feet shorter than an elephant and a hippopotamus is at his greatest length actually a yard longer.

And speaking of size: Did you know that there are some antelopes only ten inches high while there are others which have horns more than five feet long? Did you know that giraffes have been found eighteen feet, seven inches tall or twice the height of the average nine-foot room and that a giraffe has a tongue a foot and a half long? Did you ever hear that the ancestor of the horse was no bigger than a fox and had teeth like those of a monkey? Sizes are interesting when they are compared. As an instance, we all know that whales are very large, but it is interesting to note that the largest are just about ten times as long as an elephant.

Other natural history facts are interesting to the mathematically minded, and it is easily reckoned that if all the fish eggs were to develop normally and the young fish live, they would fill the oceans in a very, very short time. Then take the humble rabbit which lives seven or eight years, if permitted to do so, and breeds on the average six times a year and has from three to eight offspring which begin to breed again at an age of six months. Figuring this quickly on paper I make the total family and descendants of one pair of rabbits more than 30,000 in two years. But it is all not so simple as it sounds. Rabbits die easily and must have a huge amount of green stuff to eat. However, no one can deny that they do their bit.

But while we are still on the subject of rabbits, there are "rock-rabbits" which are not rabbits at all and some of which never go near rocks but grow three clawed toes, climb trees and have teeth quite similar, except for their size, to those of the rhinoceros. As for the rhinoceros, he is strange enough in himself but seems even more peculiar when you know that he is related to the horse and that his horn is not really horn but hair.

I suppose that by now you think I am inventing fairy tales but I am not. I should be quite willing to swear that I am telling the truth,—not the whole truth because that would be endless—but nothing but the truth. Then, too, there are many things about our domestic animals which many never know. We hear people speak of wild horses out West. Well, these are simply domestic horses gone wild; the only real wild horses living today are in Mongolia. On the other hand we think of camels as domesticated animals and of the eastern buffalo as gentle enough to be handled by a child. The buffalo can be handled easily by certain people but he is also a good match for a tiger and is dangerous if he has not had enough water to drink or is aroused. The camel is never really tame but is so stupid that even though he is savage, he can be easily managed. There is a South American camel, too, which has no hump and which provides food, clothing and even fuel for the Patagonians and Peruvian Indians. He is called a guanaco and is found in most zoos.

Goats and sheep are so much alike in general that it is hard to tell which is which, but you can always do so if you happen to know that a goat's tail turns up while a sheep's turns down. Goat's milk is more digestible than cow's milk and contains more solids, but one of the most interesting things to know about it is that its milk is free from tuberculosis germs. Another interesting thing about goats, sheep, oxen and also antelopes and giraffes is that they have a separate compartment in their stomachs where they can store hastily snatched meals until they have the leisure to chew them over more carefully and digest them properly. So it goes. One finds that some dogs eat crabs, that Eskimo dogs and wolves do not bark and that if your cat's hind toes are black he is probably descended from royal Egyptian stock more directly. On the other hand, if his hind toes are pink with black spots, he has quite a bit of European wild cat blood in his veins, though he probably has both anyway and perhaps just a drop of Chinese.

ELEPHANTS MAY BE BORN WITH A NICE COAT OF FUR

Yes, indeed, and they walk on the tips of their fingers and toes and they use up about a yard of solid tooth in a lifetime

But these are all well-known animals. What of those less well known? What of the bats that eat fish? What of the fossa which is only five feet long and carries off goats? For he is the largest carnivorous animal in Madagascar. What of the okapi, which was discovered by civilized man in 1900 and looks like a cross between a zebra and a mule but is related to the giraffe? What of manatees which have undoubtedly been mistaken for mermaids though they look much more like very old mermen, and what of the duck-billed platypus and the spiny echidna which belong to the lowest order of mammals and lay eggs and have poisonous spurs analogous to the fangs of snakes but carry them on their ankles instead of in their mouths?

There are just as many whys as there are whats. Why, for instance, is the young kangaroo born with very small hind legs and large forelegs when it is evident that the hind ones must eventually be far larger in order that he can jump and run on them as he grows to full size? Why does the Japanese waltzing mouse spin around after its tail? Why, oh why, do lemmings suddenly start a bee line march to the sea, marching by night and sleeping and feeding by day until they reach the shore where they hurl themselves into the ocean and are drowned?

If the mammals cause us to wonder many whys, so also do the birds. Do you happen to know or can you figure out why an auk's egg is more pointed at one end than at the other, why the flamingo holds his head upside down when he is feeding or why the jackdaw keeps building sticks on his nest until it sometimes reaches a height of twelve feet? Very few people know even a small percentage of the whys of bird life.

Let us look at some of the facts for the interest they contain: magpies, ravens and jays, along with other kinds of birds, have a remarkable capacity, when their mates are killed, for obtaining new ones in a few days. In the case of the magpie and jay, a large gathering of birds of the same species is said to appear on the scene, and apparently the mate is selected from them. The bower bird is thoughtful of his mate because he clears a piece of ground and builds a play-ground for her, decorating it with shells, fruits, stones, flowers and in fact with any gaily-colored object which he can find and transport. His cousin, the gardener bower bird, builds a hut about three feet in diameter of orchid stems covered with moss, at the foot of a small tree. The hut is left open at one side where on a bed of moss the ornaments—flowers and berries—are replaced as they fade. The playgrounds are used by both birds but the male does all of the building and decorating. The nests are not connected with the playground but may be at some distance away.

Flight is a wonderful thing. One can read how it is possible for storks and vultures to rise to great heights without flapping their wings. You can learn why ducks and geese at times cannot fly at all, how the owl flies so

silently and that plovers travel fifty miles an hour, while swifts can fly circles around an aeroplane that is going sixty-eight miles an hour, and for fun or under stress can increase their speed to well above a hundred miles an hour.

All of this you may have already known but did you know that the nightingale sings all day as well as at night, that "osprey" feathers do not come from the osprey at all which is white, dark brown and black, but which has one of the most beautifully vari-colored eggs known? Do you know the difference between an aigrette and an egret? And wonder of wonders! Did anyone ever tell you that young flamingos are hatched with their beaks perfectly straight? I wonder what happens to give them such a bend later on!

Many things are interesting about the young and the hatching of the young of birds. Grebes carry their young on their backs and when danger threatens they take them under their wings and dive with them. Young of some penguins are cared for by the colony and not simply by their parents. Perhaps that is why they are so happy that they take joy rides on blocks of floating ice. Humming birds build their nests exquisitely of vegetable down, like that of the milk weed, and spiders' webs, and that surely sounds like a fairy tale, does it not? But certainly when I tell you about the villainous cuckoo, you will doubt me! However, it is stated on very good authority that the mother cuckoo watches another bird's nest and when the opportunity comes, flies to it, picks up one of the eggs and quickly lays one of her own in its place. She then flies away and devours the stolen egg. This is bad enough but her young are quite a bit worse for as soon as they are hatched and while they are still blind they back up against any other young birds in the nest and push them over the edge so that they fall on the ground and are killed. But even that is not the greatest depth of villainy for it is said that the cuckoo can actually make her egg the color of those of the birds who are her victims. She cannot change the color at will but in countries where she is found to prey on some certain type of bird her eggs after a while do come to match this bird's in color.

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PENGUINS ARE NEAR-COMMUNISTS

The young of some species are not cared for by their parents alone but by all the birds in the colony

PHOTOGRAPH INTERNATIONAL

A GIRAFFE HAS A FOOT AND ONE-HALF TONGUE

And giraffes have been found measuring eighteen feet and seven inches tall

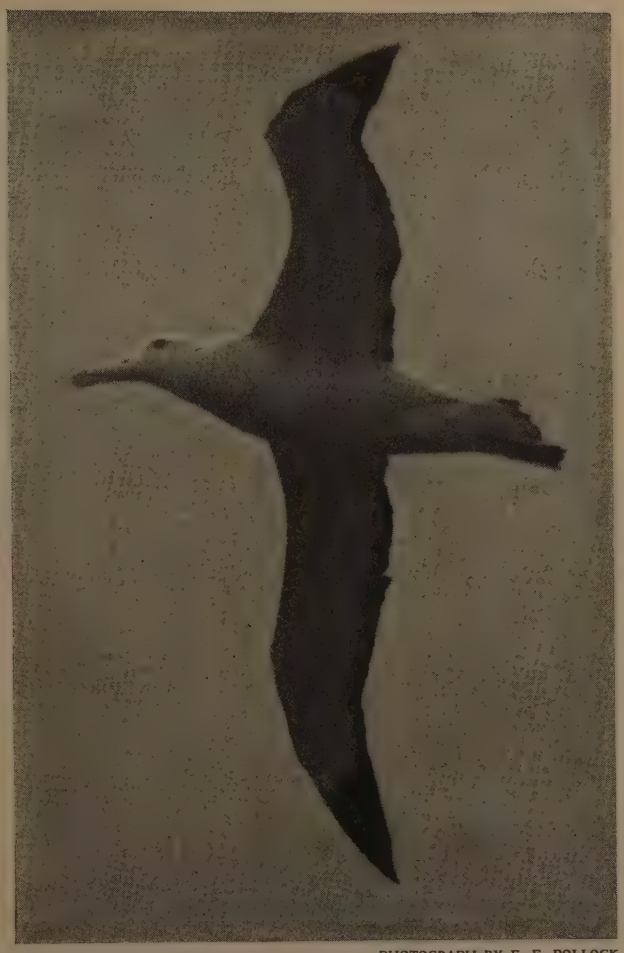
Some birds are quite as silly as human beings for they eat narcotics which put them to sleep, become intoxicated on old fruit and the albatross sometimes eats so much that it cannot fly at all. Though some birds have shortcomings, such as not being able to see blue or violet, and being morally as bad as the cuckoo and as stupid as the albatross, they are nevertheless clever in other ways for they have at least ten ways of getting the fish they like to eat. Other things are even more interesting, such as the cormorants that the Chinese have trained to fish for them and which are taken out in large numbers in boats until they are near the fish and are then released to dive after their prey. But alas, the poor birds do not get the fish even after they have caught and half swallowed them,

for the clever Chinese master keeps leather bands about their necks just tight enough to stop the swallowing of the fish but not tight enough to shut off their breath. You do not have to feel sorry for the birds though, because they get their share of the catch and probably enjoy the chase.

Men have used birds not only to catch fish for them but in falconry since 2000 B. C. in China and at very early times in the rest of the world; all sorts of hawks and falcons and even eagles have been trained to hunt for other birds and for small game. In Mongolia the "berkute," a great eagle, is flown to take antelopes and wolves. The training of a bird for the sport of falconry is a long and painstaking task but when you read how it is done you realize what an interesting thing it is and why so many kings in the past were so proud of their fine falcons.

Thus we see that there are many strange and interesting things to be found out about birds and animals and, though it is perfectly true that the best way to study them is in the field where they can be seen at their work and play, yet no one can deny that many happy hours can also be spent in reading about them and in so learning from other careful observers about their habits and peculiarities. In such reading one learns what to look for and after such reading a trip to the zoological gardens becomes doubly interesting. But the best fun of all, the fun which makes all great naturalists become naturalists, is that of trying to find out why certain things are done.

In the never ending struggle for existence, which goes on in this world every day and every hour and minute of the day, certain attributes are developed which make life possible for each individual, while other attributes are in the process of being discarded as no longer necessary, due to changes in environment. Nature is above all the great experimenter and Nature is never entirely satisfied but is always creating new forms or new combinations of old forms. It is when we fully realize this that we begin to appreciate the tremendous flux of this great universe about us and to understand how modest a place man, in all his pompousness, really occupies. In fact, knowledge of Nature is one of the surest ways to give us balance and breadth of vision.



PHOTOGRAPH BY E. F. POLLOCK

THE SNOWY ALBATROSS, SOMETIMES A GOURMAND

Often it will eat so much that it cannot fly at all, which, it would seem, is rather silly

THE CUCKOO SHIRKS PARENTAL DUTIES

The mother bird watches the nests of other birds and lays its eggs in them in place of the owner's eggs

PHOTOGRAPH BY JAMES C. McGILL-NUTT

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How are the song of the bird, the noise of the waterfall, the rustling of the leaves, and many another Nature sound that comes from the radio loud speaker manufactured? What goes on in the radio studio is told in a fascinating article by Dorothy Pletcher entitled "When Nature Goes on the Air" in the July issue. It is one of several outstanding features of the next Nature Magazine.

LICHENS, THE PLANT PIONEERS

MISUNDERSTOOD AND TOO MUCH NEGLECTED MEMBERS OF THE PLANT WORLD

BY FRANK P. SIPE

CETRARIA JUNIPERINA
A golden-yellow lichen beautifying the yellow pine forests

THE PLANT world, like the world of human beings, has certain races that by nature seem more suited than others to entering uninhabited regions where life is apt to be a harsh struggle with the elements. Such races of men we call pioneers, and the same term can be applied very aptly in the plant world. No group of plants is found that invades places so hostile to life as do the lichens.

Many persons will ask themselves what lichens are, anyway. Folks who enjoy contacts with Nature through field excursions, if their interests are broad, soon become acquainted with a wide range of living things. They will learn something about the birds, the spring flowers, the trees and shrubs, and the lowly mushrooms. But many may have frequented the fields and woods for years, without having given more than passing attention to these plants. Yet should one spend a little time in getting a general idea of their structure and mode of life, it might prove to be the gateway to a most fascinating subject.

There are several reasons why lichens are so little known. One of the most important is probably the tendency to call them "mosses", although true mosses and lichens are less alike than toadstools and seaweeds. Several hundred years ago people knew very little about the life processes of plants. Some that had medicinal value were described in a superficial way. But practically nothing was known of their methods of reproduction, of getting food, or of adaptation to surroundings. At that time any lowly plant came to be called a moss. But with more careful study it was soon learned that there were many well defined and distinct groups among these lowly forms, and the word moss was retained for one of these groups, the other groups being given other names.

IN AN UNSPRAYED APPLE ORCHARD
It lay forgotten for several years, and Usnea, Cetraria and Ramalina have moved in and almost covered the neglected trees

During periods of the year when the weather is moist and warm, a person might be agreeably surprised, should he risk the clamminess of the dripping woods, to find that myriads of delicate gray or greenish plants have appeared on the ordinarily dry, lifeless bark of tree trunks and limbs. In many parts of the United States one may see, on rainy days, an oak woods converted into a veritable fairy land of graceful wreaths, delicately branched stalks, and dividing lobes. These are, for the most part, a soft gray, or they are tinged with various shades of green, frequently varied with the black, red and orange of their fruiting bodies.

Lichens are a strange group of plants. For a long time their true nature was not known, even by those persons who devoted much time to their study. In fact, it was only about fifty years ago that Schwendener published his first brief article on his ideas of their structure and nature. The publication of this article, in 1867, raised much protest from those who had studied lichens. But the theories of Schwendener have stood the test of experiment and stand to-day as the true explanation.

Schwendener advanced the idea that a lichen is a combination of two kinds of plants, an "alga" and a "fungus". Algae are common and well-known, familiar examples being the green scum that collects on ponds, in flowing streams, on moist rocks and frequently forms a green paint-like film on twigs or tree trunks. Fungi are likewise well-known, the cottony, web-like bread mold and mildew being examples that all have seen. The algae, being green, can manufacture plant food from the carbon dioxide of the air; the fungus part of the lichen secures its food from these algae, and in return furnishes a place for the algae to live, protected from direct contact with the outside air. Thus the two kinds of plants, alga and fungus, live together and in such close association that they make one plant, the lichen.

This queer and novel idea of Nature has apparently proved to be a happy one, because there have appeared thousands of species of lichens, adapted to a multitude of habitats. They grow wherever there is any reasonably stable object to grow on, such as rocks, soil, trees, and buildings. They resist cold and drying, and will remain dormant for long periods, yet swell out and continue their life activities as soon as warmth and moisture conditions are suitable.

One striking characteristic of lichens is a method made use of for their distribution. When dry days come, the plant becomes a brittle and shrivelled mass, easily broken. Fragments that break off and are scattered by winds may find new locations. As soon as each fragment becomes moist it may develop into a new plant. In addition, many lichens produce small fragments, called soredia, during their growth. These soredia often develop in small pustules. Each soredium is very small, consisting of just a few algal cells and a few strands of fungus. They are hence very light, and may be wafted long distances by a faint breeze.

Because of their efficient means of dispersal, and their great resistance to adverse living conditions, such as dry periods, cold, and sudden changes in temperature, they are the most widely distributed of plants. They are found in the most northern regions, near the tops of the loftiest mountains, and on rocks of almost arid deserts. Hence lichens are often spoken of as the plant pioneers, because it often happens that bare rocky slopes and mountain tops are invaded first by these hardy plants; these are then followed by mosses and flowering plants, after the lichens have reduced a thin film of the hard rock to soil.

LICHENS ON A TREE TRUNK

(Below) Wherever bare rocks outcrop in moist, shady places one is apt to find the lichen Pilophorus

At many places in the Cascade Mountains of Oregon and Washington, one finds masses of hardened lava, piled high in irregular heaps, as though it had oozed forth but a few centuries ago. The surface of these hard rocks is covered in many places with crust-like lichens, some a sombre gray, scarcely distinguishable from the hardened lava; some a rather showy yellow, which in places may glow forth like patches of gold. Many of the cliffs about Crater Lake, in Oregon, have been thus beautified by the lichen artists, and the sombre hue of the gray basalt enlivened by flashes of yellow

and orange intermixed.

The magic of lichen life can only be observed on days most favorable to their growth. Such a day must be one when the very air seems loaded with rain, and this rain falls gently but intermittently, with periods between when the sun struggles to get through, but never quite succeeds. On such a day each lichen unfolds from a dry mass to a thing of real beauty, like a Japanese magic flower when placed in water. Going forth at such a time, one will find them everywhere, on the limbs and trunks of trees, on old stumps, rocks, fences, among the grasses on the soil. The old unsprayed apple tree will often be the home of many species.

From the days of Theophrastus, the great Greek naturalist, lichens have been observed and described by students of Nature. Some were used in the manufacture of the most beautiful dyes of ancient times; others were used for their supposed medicinal value. To many observers they were a strange group of organisms, with a mode of life apart from other known plants. Poets have made occasional reference to lichens, usually with the purpose of conveying the impression of lowliness or of mystery, or for painting a vivid word picture of some locality. Browning, for instance, in picturing a path along a deep gorge, with steep rocks on the other side, says:

"On our other side is
the straight up rock;
And a path is kept 'twixt
the gorge and it
By boulder stones where
lichens mock
The marks on a moth—"

Lichens also furnish food for beast and man. The reindeer "moss", which in reality includes several genera of lichens, is the main winter food of the domesticated reindeer, and is thus an important aid to those tribes of northern Europe and Asia who have long depended so vitally on this creature. And many an Arctic explorer has saved his life by eating "tripe de roche", a group of fleshy lichens.

The study of lichens offers an alluring field for the student of Nature. They are widespread, easy to collect and preserve, and offer fascinating studies in adaptation to varying living conditions. A little effort would enable one to become familiar with some of the more common and conspicuous genera, such as *Parmelia, Peltigera* and *Cladonia.* Once started, one would doubtless be led to explore further into the group, and thus become acquainted with a new and widespread form of life.

ONE OF THE LEAFY LICHENS

This one—Sticta—is one of the most common in this group. (Below) This bit of antique lace is another of the many forms of lichen growth and is known as Parmelia

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Just as the index in this issue of Nature Magazine makes the last six issues that form Volume 21 of great reference value, so does the Ten-Year Index to Volumes 1 to 20 give them inestimable worth. This Index is now available at one dollar a copy. Bound back volumes of Nature Magazine are available with three exceptions, and in most instances single back copies to fill out volumes may be obtained.

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OLD WIVES' WISDOM

LEGENDARY SUPERSTITIONS ABOUT MANY INSECTS PERSIST

BY STEPHEN HAWEIS

LINOLEUM PRINTS BY THE AUTHOR

Most people dislike insects, but it is difficult to imagine how we can have lived in such close association with them for so long without having learned a little more about them. Our shadowy notions often make us hate the useful and protect those that are harmful. How some of our popular superstitions ever came into existence passes all comprehension. Why, for example, is the cricket on the hearth, which chews the corners of everything except the kitchen stove, considered particularly lucky in a house? Its chirp is pleasant to hear, certainly, and the Japanese cultivate and keep many varieties in cages on account of their music, but they do not attribute to them powers of divination about love affairs, as do the Italians. At least they prefer them caged. And who, I wonder, determined the fact that it is innocuous to kill a spider in the house in the morning, but very unlucky to do so in the evening? One tiny red spider must be preserved at all times because it is a money-spinner, but should a tarantula bite you it is well known that you will shortly begin to dance, and dance until you die. The astute Neapolitan peasants invented the "tarantella" for the diversion of visitors in about 1840, pretending to have been bitten by the tarantula spider; the dance is quite modern, but how old is the inspiration?

This generation is forgetting the ominous death watch, because most people sleep in metal beds, but the tapping of *Anobium tessellatum* calling to its mate as it burrowed in the old wooden beds and wainscotting of our grandfathers' time was a sure sign that a sick man would die, unless he heard it, in which case he had a slight chance of recovery. There were other companions, too, in the old-time beds. They were thought unavoidable. It reminds one of the little negro child who was asked by the visiting nurse if she had lice on her head. Shyly she replied: "Course I is, everybody do!" Times have changed, fortunately, in both respects, thanks to entomologists who discovered the life history of the insects and consequently how to get rid of them.

Another terror is the dragon fly, which sews up children's eyes! It is the Devil's needle, and the fact that no child has ever had its eyes sewn up makes no difference at all. The fact also that the dragon fly is a true mosquito hawk and destroys large numbers of mosquitos before they can lay their eggs on the surface of ponds and puddles does not help them. They are servants of the Evil One.

But there are insects whom old wives elected to consider good, and a naughty one they picked out for praise! *Mantis religiosa* is the fiercest of terrible dragons to the world of insects; it will attack and tear any of them to pieces, and its paws folded as for prayer are meant for murder without regrets; woe betide any little six-footed citizen that ventures near enough to be "prayed" upon by the sanctimonious mantis. It has no more hope of mercy than a sinner in the grasp of Cot-

ton Mather. But the principal benefaction to man with which legend credits the pious insect is to point the way for a lost traveller. He has only to take a mantis in his hand and it will at once obligingly point to the correct road. *Homo sapiens*—the wise! Well, homo sap, anyhow!

Then there is the earwig, so named by a naturalist with a cold in his nose from its miraculously folded wings, the earwing is what must have been meant, from their ear-like shape. This creature has gained the reputation of crawling into people's ears and eating its way into the brain. It's a good trick, if they do it, but though earwigs will run to hide in any little hole or cranny never a one has succeeded in living in an ear yet; nevertheless the legend is widely believed in Europe and America.

Of course insects of all kinds are out in all weathers and should know something about it, but just why certain species should be considered so very gifted is another difficulty. Swedes can always discover months in advance what the ensuing winter will be like if they can find a grub of the common cockchafer. If it be white the winter will be white and severe; if bluish, a condition caused by its being full fed, it will be mild. And if part of it is white and the tail end bluish, of course you have guessed right, the first part of the winter will be cold and its latter end milder. In Denmark, on the other hand, they can tell whether the harvest will be late or early by the position of the mites on the body of a dung beetle. If they are between the forelegs, it will be early, if between the hind legs, late. Simple, isn't it?

Matthiolus tells us that every oak-apple contains either a fly, or a spider, or a worm. The first foretells war, the second, pestilence and the third famine. And if you have any predilection about the kind of disaster you prefer, you can look for another oak-apple! The death's head moth, *Acherontia atropos,* is another politically-minded insect. The pattern of a skull and crossed bones faintly marked on its back makes it an infallible judge of the fate of nations. Besides it makes a tiny, pathetic sound and does its best to give warning of the pestilence and death which follow its appearance. *Blaps mortisaga,* a beetle, will do as much for you if you cannot catch a moth, and in Barbados, the messenger of disaster is a kind of grasshopper.

At times vast numbers of moths, butterflies or other insects may appear suddenly and, to a people which imagined that the Almighty concerned Himself with them alone, it was natural enough to suppose that such unusual happenings were due to his direct concern with their petty affairs. I have myself seen mayflies, which breed in the River Arno, killed by the street lamps in such numbers that traffic was impeded and people walked in them ankle deep. Certain species of butterfly excrete a red fluid on emerging from the pupa, which of course was taken for blood. Showers of blood miraculously thrown from Heaven could mean only one thing,—war! Our forefathers were well aware that all is not gold that glitters but they were not so sure that all that looks like blood was not blood. It was red; blood is red, and they believed the worst. In the Middle Ages everybody always seems to have believed the worst, and they were generally right. They had no microscope tests to apply, but they did have the plagues of Egypt as precedent and that was enough to satisfy them.

The blank ignorance of the simplest facts of Nature which was universal until comparatively recent times has thrown fear into many a susceptible heart. The grub cell of the leaf-cutter bee, so delicately made, was often mistaken for the work of human hands and when dug up, must, obviously, have been buried by a witch. The tiny

case probably contained nail parings or a wisp of hair; incantations might have been sung over it while cauldrons bubbled and black cats flew through the air. They dared not touch the terrible object to determine what it really did contain, so the nearest disagreeable old lady in the neighborhood was generally sprinkled with holy water and burned to death. Did nothing unusual happen thereafter, then clearly the witchcraft had been broken. Alas, it is hardly time yet to laugh very heartily about our ancestors' belief in witchcraft, because the believers are not all gone from the back hills of any State which is not yours.

Some superstitions are harmless enough, and even beautiful to the poetically inclined. One should always tell the bees of a birth, marriage or death in the family. Bees are a part of the household somewhat more intimately allied with it than mere cows and chickens. If one does not inform them of a major event they will feel offended and waste a good deal of time hanging about the house trying to find out the details, and of course one sees a distinct falling off in their honey output. It is not only poetry therefore; it pays to treat the bees with proper consideration.

What was good enough for our forefathers is good enough for us, people sometimes remark, and this is how superstitions remain from age to age. It is only in recent years that we have begun to demand proofs from those who tell us about Nature's wonders, and the Missourianism has not resulted in fewer wonders but more. "Out of the strong came forth sweetness", is poor natural history if it refers to the birth of bees in the body of a lion. We know now that the sage did not know the difference between a honey bee and an eristalis fly, which happens to resemble the bee more than a little. But long after the simple facts about common things are known to everyone, children, we hope, will still say: "Lady bird, lady bird, fly away home. Your house is on fire and your children will burn," to that valuable little member of the beetle family which kills the plant lice on our rose trees. Inexactitudes may be permitted to children, as fairy tales, which stir the imagination and promote the most beautiful of our daydreams. Grown up people however, might hurry a little with the growing up. The courage which we can rely upon to face tempest and battle can be trained to face mice and spiders and a thousand other inoffensive and harmless creatures. Wisdom we know is better than rubies, but most people still choose rubies—and get neither!

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AN UNUSUAL FLORIDA VISITOR

BY H. S. FOX

BLOWN thousands of miles from their northern home by recent strong winds, the dovekie, pictured here, visited the Atlantic coast of Florida for the first time since 1871. The dovekie, *Alle alle*, is one of the smallest members of the auk family, and like most of the members of this family it is a curious looking bird as it walks around holding its body almost completely erect. It is slightly larger than a robin, has very short legs, and feet adapted solely to swimming. The feathers are glossy black with white on the head, throat and wings. The markings of the winter coat are different from its summer coat. The dovekie is a bird of high northern latitudes living on the rocky coasts of the North Atlantic and Arctic oceans where they breed, and where thousands are slaughtered by the natives for food and clothing. A single egg is laid by the bird on the bare rocks. In winter the dovekie may be found along the coast of the New England states. Most of the little visitors that came to Florida were in a pitiful condition due to the buffeting of the wind and waves and the lack of food. Hundreds of these birds were scattered along the Atlantic coast of Florida as far south as Miami. Some of these were alive, but most of them were dead. The ones that were alive died soon after capture.

THE BEAVER OF KILLISNOO

A LEGEND

RECORDED BY
ELEANOR GALE MAYER
AND
GEORGIANA C. CLARK

On his return from one of his hunting trips, a Chief of the old tribe of Killisnoo brought home a baby beaver and had it raised as a pet. Now the beaver, of course, is a home-loving animal. They make their homes in swamps beside streams, along which the alder, poplar and willow shrubs grow thickly. In time a real little apartment or settlement house grows up around the original house or lodge. Many families live under its rambling roof, although each family has its separate quarters. The wind does not penetrate into their sheltered homes, and when the sun shines warmly, the beavers sit on their small porches and cheerfully gossip. Always one of their number is on watch and in case of danger he gives the alarm by slapping the water with his great flat tail, making a loud resounding noise. Then he dives into the water, as do all the others.

So it was no wonder that the wee beaver was homesick and pined for his home and kindred. The Chief's village was close to the edge of a large sheltered bay. True, the sun shone warmly here sometimes and there was plenty to eat, but the village children teased the poor little stranger, and the Chief laughed and thought it was funny when the beaver told him about it. Behind the village the timber rose dark and somber, and always gave off a weird sobbing sound. The sun did not penetrate far into it and the wind blew chillily off the icy, salt water of the bay and much of the time the rain fell in a steady, gray downpour.

When the Chief's people started to build their village, they first cut down some of the trees which grew close to the water. They cut them a few feet from the ground, and put their foundations across the stumps. In time the interstices between the roots became filled with soil and gravel, and also some of the stumps rotted away in the years that had gone since the village was built.

One day, after the Chief had laughed at the little beaver's appeal for help against the teasing of the children, the beaver hid in a little cave in the bank just above water level. There the children could not see him. He was angry and so wanted to hurt those who had hurt him. As he looked around he saw how easy it would be to dig out the soil under the ancient village, and the old tree stumps would collapse under the weight of the houses above.

The beaver worked busily and every day the tide carried away the piles of soil he loosened and put near the water's edge. As he dug he composed a song to sing as his farewell to them.

Then one day in early spring the excavation was almost completed. It was time for the spring storms which take the place of the equinox in more southern climes. The beaver was homesick for his swamp. He smelled the perfumes of blossoming shrubs and plants with which the warm soft wind from the south (Continued on page 308)

PHOTOGRAPH BY ANSEL EASTON ADAMS

DEERHORN MOUNTAIN IN THE KINGS RIVER REGION OF THE HIGH SIERRA

With its bright sunny days and clear cool nights during the summer months, its superb scenery and the alluring heights, the High Sierra lures the outdoor folk

CAMPING AND CLIMBING IN THE HIGH SIERRA

BY FRANCIS P. FARQUHAR

VICE-PRESIDENT OF THE SIERRA CLUB

AN EXAMINATION of the map of California will indicate better than will words the general position of the Sierra Nevada. It will not, however, disclose the characteristic features of this beautiful range of mountains, features which make it famous as an ideal region for camping and climbing. The attractiveness of the Sierra, particularly that portion known as the High Sierra, is due in part to the large proportion of bright sunny days and clear cool nights during the summer months, in part to its superb scenery, but perhaps even more to the essential purity of its elements. The waters of the High Sierra are sparkling and clear, the trees are splendid individuals grouped in stately forests, the granite walls and towers are strong and clean, the meadows bright with innumerable flowers.

In this article in our series on how to camp and what equipment to have, Mr. Farquhar gives us the benefit of his wide experience as camper and mountain climber. Readers are reminded that, in addition to the practical information contained in this series, the Camping Editor of Nature Magazine will be pleased to give further specific advice and to aid readers in planning their camping trips, or in solving equipment problems.

All campers in the High Sierra who wish to get away from the head of automobile navigation or from fixed public camps will require animals for transport of equipment and provisions. Exception is made of seasoned hikers who are willing to undertake very arduous work in back-packing heavy loads. This can be done, but if extended for more than a week usually becomes very fatiguing. Much more enjoyment will be found if the burdens are placed upon the backs of quadrupeds. Three species are in use in the Sierra —the horse, the mule, and the donkey or burro. Of the two larger animals, the horse is perhaps the more docile, although the more apt to stray at night. He is frequently chosen by small parties doing their own packing, but in the Sierra Nevada is not often found in packtrains as a beast of burden. The

BOOTED AND HOBBED
Nailed boots have their place and many prefer them

mule has many advantages, such as durability and adaptability to rough trails. Whereas a horse shows his breeding, a mule shows his training, and a well-brought-up mule is really a very intelligent and tractable animal. A badly trained mule, or one that has been abused, may still prove a useful member of the pack-train, but not in the hands of amateurs or of those who are not proficient in the language he understands.

Horses and mules each pack about the same weight. If well packed and well fed an animal may be counted on to carry about 175 pounds, although that is a fairly heavy load. Packs composed largely of concentrated weights, such as canned goods and hardware, should not much exceed 150 pounds per animal. The art of packing is not to be learned in a day, and if a skilled packer does not accompany the party, it would be well for those undertaking the duties to be very sure before they start that they know thoroughly at least one "hitch" and that they are made acquainted with the more salient personal idiosyncrasies of the respective animals. One can learn from experience, and usually without great disaster, how to prevent packs from shifting and slipping, but it is little short of criminal to learn about sore backs and tender hoofs at the expense of the victims. In short, on a first trip it is both wise and economical to employ a good packer to look after the animals.

The number of pack-animals to be taken will depend upon the number of people in the party and the length of the trip. A party of eight, for instance, willing to forego luxuries, will require for a two weeks' trip about five animals. This is usually the maximum number that one packer can be expected to handle, and with this number he should have the assistance of one or two members of the party in packing-up if prompt starting is to be the order. The packer will invariably ride; if the members of the party also ride, there will, therefore, be nine horses to look after, in addition to the five mules. It will greatly improve the efficiency of the party and enhance the enjoyment of the trip if an extra man is employed as packer's assistant and horse-wrangler. This will leave only the cooking to be done by the members of the party. Having added a second packer, it will probably be found advisable to add one or two more mules, so that by the time the party is ready to start it will be found that there are fifteen or sixteen head of stock. That is the way a party usually builds up in actual practice, in spite of all attempts at curtailment. Add a good cook, and the outfit is complete.

CANVAS AND RUBBER
This footwear has become increasingly popular with hikers

An outfit such as the one just described is designed for a party which intends to move camp nearly every day and to cover a considerable amount of territory. If the party is content to move only at intervals of three or four days, or prefers to spend most of the time in one or two semi-permanent camps, and if the members walk and are willing and competent to do the packing themselves, the expense would be about one-third. Another plan, frequently used by families with children, is to engage an outfit to transport the party and equipment to a camp-site one or two days' journey from "the jumping-off place," and to return for them at the end of a designated period.

THE ART OF PACKING IS IMPORTANT
It cannot be learned in a day and unless a skilled packer is along one should give this real study

So much for packing with horses and mules. Let us now consider the humble donkey, known also as the ass, or the burro. Scorned by many, unjustly abused by some, he, never-

theless, retains throughout a large part of the world his immemorial position as the beast of burden of the poor man and the man who is not in a hurry. On Sierran trails he does his quota of work; and off the main trails, in scouting for new routes, he comes into his own. He can subsist upon the most meager pasturage, and can be coaxed through rock-piles that would break the legs of his larger relatives. There was once a sign at the beginning of a particularly rough High Sierra trail: "This Trail is Jack-assable—for Horses Impassable!" The burro has his faults—it is sometimes hard to persuade him to do anything rash—he is slow—his burden must be light (not over 100 pounds) if he is to move at a man's pace; but he also has his virtues. Burros are cheap. With one for each member of the party an ample supply of provisions and equipment can be transported at a low cost.

The size of the party and the method of transportation having been determined, the next question concerns the general equipment. Excepting for semi-permanent camps, large tents are more trouble than they are worth. In the High Sierra, in fair weather, no one wants to sleep in a tent. Rain at night is so infrequent that it may be ignored in making plans. A hasty rig of canvas and waterproof sheets will usually suffice to protect provisions and give shelter. Nevertheless, if transportation conditions permit, a small tent, weighing not over ten pounds, is sometimes desirable as headquarters and for emergency shelter.

THE AUTHOR HIMSELF
Snapped at a high spot in the High Sierra and happy to be there

Stoves are not needed, excepting for very large parties. A light-weight reflector-oven is useful; a Dutch oven is even better, if the weight can be carried. A collapsible framework of light rods saves time and is more efficient for supporting pots than is a rock fireplace. Firewood is everywhere abundant. Cooking utensils are nowadays about the same everywhere, and no special types are required in the Sierra. Weight, bulk, and durability are always important factors. A set of pots that will "nest" is much to be preferred to assorted sizes. On back-packing trips it is astonishing how much can be done with a few large tin cans and their lids. One or two pot-lifters will be found useful. Each member of the party should carry his own cup and spoon. It is also a good plan for at least one member out of three or four to carry a two-quart pot for making tea along the trailside. Tea or bouillon at lunch or in the afternoon is a daily pleasure not to be lightly foregone.

Each party should have an axe and a shovel. These should be good strong implements, and the axe should be kept sharp. Small "trench-shovels" and light hand-axes are of little use. The shovel is important, for refuse-pits must be dug, trails must occasionally be broken through snow, and, if anyone is so careless as to let a fire spread, it is indispensable. Tables and camp-

A ROUGH TRAIL IN THE SIERRA
Trail-trained animals, sure of foot and with endurance, are essential in such country

A FAITHFUL BURRO WITH ITS LOAD
That is, it is hoped that it is faithful and will not wipe off the pack against a rock

chairs may rank as necessities with some people, but logs and rocks and packing-boxes are cheaper, and are usually considered sufficient. A few extra ropes, a few canvas tarpaulins, and a few five-gallon buckets will come in handy. A gas lantern is useful. One thing should never be forgotten—a shoeing outfit, with a good supply of nails and shoes. Even if you can't shoe a mule yourself, you can usually find someone along the trail who can; but you ought to have your own supplies. Burros, of course, go unshod.

CAMPED BY A CRYSTAL HIGH SIERRA LAKE
The gentleman with the frying pan poses before going on to more serious business of the inner man

The question of provisions brings one face to face with lists, which require more or less intricate computations and usually result in disagreement. So, leaving specific details until the time for action, let us here consider only a few generalities. Cans are heavy, but convenient. They can be greatly reduced in number by the use of macaroni, spaghetti, rice, oatmeal, and other grain foods, powdered soups, powdered milk, dehydrated vegetables, and dried fruit. A reasonable proportion of cans, however, is inescapable. Potatoes are too heavy in proportion to their food value. Meats do not spoil in the High Sierra if hung under screen. Eggs can be carried for weeks in crates. Canned butter is good, and keeps perfectly. Hams are highly rated by experienced campers. Take plenty of sugar—active life in the high altitudes burns it up. Jam is always popular.

A CAMP AT PALISADE CREEK
Where nights are spent in the clear cool air without benefit of tent and one awakes reborn with vigor

Trail-side lunches can be made up of pilot-biscuit, Swedish rye-crisp, or other breadstuffs, with cheese, dried beef, sardines, kippered herring, and sweet chocolate, raisins, dried apricots, figs, and dates. Water of purest quality will be found everywhere, and occasionally a natural soda-spring.

For personal equipment the two things most essential to have right are the sleeping-bag and shoes. Midsummer nights in the High Sierra are frequently cold; seldom frosty; very rarely stormy. A warm sleeping-bag is a great comfort, and one should not try to economize on quality. There are several varieties carried by outing stores which well serve the purpose, but the cheaper ones are usually too heavy in proportion to warmth. A very good bed can be made from two wool or down comforters, folded and sewn up in the form of separate bags, one placed inside the other. On warm nights one bag only need be used. A square of light waterproof cloth, about 7 by 7 feet, serves as a combined ground-cloth and cover. A small pillow and an air mattress make the bed complete.

Personal effects and small articles of clothing are best packed in a pocket-roll, of light material, equipped with tapes or eyelets for hanging on a tree in camp. When traveling, this should be rolled in the sleeping-bag, in such a way as to insure complete padding of hard objects, and the

whole placed in a dunnage-bag of heavy waterproof canvas. The dunnage-bag, when packed, should not exceed three feet in length, 18 inches in diameter, and 40 pounds in weight. A somewhat different procedure is required when packing with burros. The forty-pound bags are too heavy. It is best, therefore, to put personal effects in sailors'-canvas bags and pack them in the kyaks with the bedding folded in canvas and placed on top.

There is much difference of opinion among frequenters of the Sierra about boots and shoes. In recent years there has been a great increase in the use of canvas shoes with heavy rubber soles. They are excellent for the easier trails, for short walks, for use around camp, and for many of the mountain climbs. Nevertheless, nailed boots still have their place, and many prefer them for the protection they afford to the feet and ankles and for their more general adaptability to all conditions. They need not be very high, although the soles should be thick. The best type of nails I believe to be the cone-head Hungarian, five-eighths inch for heavy soles, three-eighths for thinner ones. They afford the best traction on the trails, hold very well on Sierran granite, and will survive about two weeks of hard wear. Steel calks, tricouni nails, and large hobs are very rarely of any advantage in the Sierra, while on the not infrequent glaciated rock they are positively a menace. Skilled climbers, accustomed to tricouni-shod boots, may find them useful in certain districts, although not indispensable. Edge-nails preserve the shoes and are good on some kinds of climbing, but they are too heavy for general use. Horseback riders should have leather shoes (without hobnails) and leather puttees, or the regulation cowboy or army riding-boot.

Socks are almost as important as shoes. It is practically an invariable rule that two pairs of socks should be worn at all times—lightweight wool under a heavy soft-knit wool. Women sometimes prefer silk stockings for the inner pair. Cotton socks and stockings are no good at all.

Not so many years ago the clothing worn by women on camping trips differed distinctly from that worn by men; today the distinction has practically vanished. The preferences of women for riding-breeches, knickers, and blue jeans are in much the same proportion as those of men. Variation of costume on a trip of more than a few days is a good plan. Spare breeches in the dunnage-bag are a wise provision for emergencies. There is little to choose between cotton shirts and flannel; perhaps it is just as well to take both. About two extra sets of shirts, socks, and underwear should be taken on a two-weeks trip—more or less, according to the laundry avidity of the wearer. It is not much of a trick to launder two sets every few days, with a bucket of hot water, a cake of laundry soap, and a running stream close by for rinsing. The tendency of the past few years seems to have been toward a decrease in the amount of clothing worn. "Shorts" have become increasingly popular; but how much is fad and how much is new-found freedom is still to be determined. Chaparral and sharp rocks may ultimately prevail against the too constant exposure of bare knees. On the other hand, much can be said in favor of cotton shirts and the minimum of underwear, combined with frequent sun-baths and plunges in stream and lake, with a warm woolly sweater to pull on when chill comes in the air. A sweater or a soft, light leather jacket should never be far out of reach when traveling in the High Sierra.

Hats are entirely a matter of personal preference. There are those who consider a big hat with a broad brim to be an indispensable protection against sunshine and shower; there are others who consider a hat to be as useless as a walking-stick. For my part, I carry in my knapsack a lightweight felt hat for use in climbing through brush or on cliffs and for such other occasions as seem to require it. Women's head-gear ranges from a mere ribbon, through the varieties of felt hats, to the wide-brimmed straw. A light poncho, or featherweight raincoat, is a most welcome article when the weather turns, as it sometimes does, to a series of diurnal thunder-showers.

It is hardly necessary to enumerate here all the articles of personal equipment that varying tastes and habits may require. Nevertheless, a few items may be mentioned. A medium-size light knapsack is needed for carrying sweater, lunch, and miscellaneous articles while walking on the trails or climbing. Cotton bandanna handkerchiefs have a multitude of uses—take at least half a dozen big ones. Add one or two silk ones for decoration. A pair of stout gloves will prove constantly useful, for protection rather than for warmth. Dark glasses are very important, sometimes vitally necessary when crossing large snow-fields. A green eye-shade is favored by many. Some kind of ointment for preventing sunburn is also important: zinc oxide, antipyrexol, and similar preparations are commonly used. A lipstick (pomade) is not to be regarded by men as effeminate, but as good insurance against cracked lips. Other essentials, to be carried in the pockets or in the knapsack, are: a waterproof match-safe, always filled; a knife; a map. The entire region of the High Sierra has been thoroughly mapped by the U. S. Geological Survey; the topography is clearly and reliably shown, although the trail indications are frequently out of date. The landmarks are so unmistakable and the country is so open that there is practically no danger of getting lost. A flashlight or spotlight should be carried in the dunnage-bag, or in the knapsack if there is any prospect of making camp after dark. Don't forget extra bulbs. Other wants are really very few: toilet articles, fishing tackle, photographic outfit—these are according to individual preference.

The only wild animal in the Sierra Nevada whose bite is to be feared is the mosquito, and he isn't so very bad. A few yards of very fine mesh mosquito-netting, however, is a wise provision. Pay no attention to rattlesnake stories; you may see one or two rattlers during the course of the trip, but don't worry about them—don't stock up with "snake remedies." Bears are found in a few localities. They are never dangerous, although sometimes

a nuisance. If you leave camp unguarded for any length of time, hang up your choicest provisions high between two trees.

The mountain climber will find many attractions in the High Sierra. Although there are no extremely difficult peaks, as compared with first-class mountaineering standards, there are many which require a reasonable amount of skill and a good deal of caution. There are, moreover, innumerable opportunities for difficult and "sporty" climbs by ridges and faces other than "the easiest way up," and there are countless pinnacles and isolated points "where the hand of man has never set foot." Most of the climbs are entirely on rock, with occasional easy snow-fields on the lower courses. Unless a deliberate attempt is made to seek out routes on glaciers and snow-tongues, ice-axes and crampons may be left at home. The rope, on the other hand, is desirable on most of the climbs off the beaten track and essential on some. But a rope in the hands of climbers who lack the knowledge of its use is an invitation to danger rather than a factor of safety. Only the best quality of long-fibred rope should be used; "any old rope" is suicidal or murderous, as the case may be. A one-hundred-foot length of four-strand, seven-sixteenths-inch is the customary thing for a party of two or three climbers. Four on a rope is one too many. The inexperienced mountaineer will find plenty of excitement and enjoyment in the multitude of climbs in which no rope is necessary.

There is very little danger from sudden storms in the Sierra, but electrical storms must be watched with care. If the rocks begin to crackle or the sparks leap from the fingers, it is time to get off the summit of a peak or the crest of a ridge just as fast as possible. In fair weather the summits will frequently be delightfully warm, but it is never safe to rely on the continuance of such conditions. No long climb should be undertaken without carrying a sweater or similar protection against cold.

Advice upon equipment for camping in the Sierra can hardly be concluded without a warning against fire. The long dry-season of the California summer renders the forest and chaparral highly inflammable. A fire should never be lighted where it can by any possible chance get out of control. Pine needles and the mold of fir forests will spread fire like powder-fuses. Rocks, gravel, sand, damp soil, and water are the only safe surroundings. There are rigid laws about fires that should be learned and observed. In the national forests a permit, obtainable from the supervisor or from a ranger, is required for making fires; the national parks also have special regulations. In some sections smoking while moving on the trails is prohibited. Experienced campers obey rules.

Excepting for the laws and regulations governing fishing, hunting, and fires there are practically no restrictions in the High Sierra other than those that decent people would anticipate without notice. Keep a clean camp, leave the site as you would wish to find it, have due regard for sanitation, don't cut live timber, don't wantonly pick wild flowers, don't be extravagant with firewood where it is not superabundant, don't hog the fishing, don't leave fires burning. With these injunctions, and with the proper equipment you will be prepared to answer the beckoning of John Muir:

> Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop off like autumn leaves. . . . Nature's sources never fail. Like a generous host, she offers here brimming cups in endless variety, served in a grand hall, the sky its ceiling, the mountains its walls, decorated with glorious paintings and enlivened with bands of music ever playing.

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ARGEMONE PLATYCERAS

BY ETHEL MARY BAKER

A GRACIOUS cousin of the Poppy family that is most at home on the olive-tinted prairies, is the prickly poppy—*Argemone platyceras*. In its native habitat, this robust annual grows two or more feet in height, and before the blossoms appear might easily be mistaken by a novice for a sort of glorified thistle, because the foliage is spiny and prickly. The leaves are deeply-notched and of a beautiful shade of bluish-green touched with a sheen of silver. The blossoms somewhat resemble in form the Oriental poppy of our gardens, although not quite so large, with petals as white as drifted snow, and fine and soft as tissue paper. The plump knob of stamens in the center is the color of butter made from rich Jersey cream.

This lovely wildling grows easily from seed and readily adapts itself to our gardens. Its requirements are simple—a rich sandy loam without too much moisture, and all the sunshine it can get. You will find it worthy of your attention.

PHOTOGRAPH BY JOHN WEBER

A CLUMP OF COLUMBINE GROWING IN A NATURAL HABITAT SETTING

While there are varieties of tame columbine, success with the lovely flower from the wild is repaid many fold in beauty as well as in satisfaction to the gardener

YOUR GARDEN—A SANCTUARY

BY ROMAINE B. WARE

HAVE you ever brought home some particularly choice wild plant, thinking to add it to your garden but found it difficult to know just where it should be planted? The ladyslipper and bloodroot, the trillium and bluebells, the ferns and trailing evergreens, these and countless other wildings may find home in your garden if you will learn their needs. If you waste them you have thoughtlessly added to the extermination of wild flowers.

A wild flower garden, a sanctuary for Nature's unspoiled children, is not the easiest garden to establish. Your soil may grow zinnias, marigolds and irises to perfection, but to plant and maintain a clump of cardinal-flower requires a different technique. Some plants demand shade, others excessive moisture, while still others must be kept quite dry.

Wild gardens are of two general types. One is where the desire is to make the individual plants feel at home regardless of effect. The other garden uses wild flowers and plants to achieve a pleasing and picturesque effect.

Before we discuss the factors influencing the success of a wild garden it might be well to consider what is understood when we speak of "wild flowers". The term "wild" must be used cautiously because what might be termed wild in one locality may rank among the choicest specimens of a connoisseur's garden elsewhere. Few enthusiasts would plant the regal lily among the treasures of their wild garden, yet a score of years ago it was unknown beyond the confines of its native home in one of the wildest and most inaccessible mountain valleys of China.

Most of us, when we think of wild flowers, mentally picture the native flora of our locality—those not generally looked upon as garden flowers. For example, jack-in-the-pulpit and the charming trailing arbutus would unquestionably be classed among the wild flowers. On the other hand, the peony, although found wild in China many years ago, would, today, hardly be con-

FERNS ADD GREAT BEAUTY
This cinnamon fern is one of many that will give loveliness to the home garden wild flower sanctuary

sidered a fit candidate for our wild flower sanctuary. This is undoubtedly due to the fact that years of cultivation and hybridizing have changed it from a simple flower as Nature made it into a highly evolved specialty. Somehow there is a quality of charm about the wildings, not to be found among the more sophisticated garden flowers.

Many wild flowers are at times classed as weeds, but here again we must use a measure of discrimination. Some one has truthfully written—"What right have you, O passer-by-the-way, to call any flower a weed? Do you know its merits, its virtues, its healing qualities? Because a thing is common, shall you despise it? If so, you might despise the sunshine for the same reason". Not a few "weeds" of the roadside prove welcome guests in our wild gardens and sometimes plants listed as choice garden subjects become most unwelcome due to the perversity of their nature.

If you would have success with plants from the wilds, you must study their requirements as indicated in the areas where they thrive. The delightful maidenhair fern, for example, demands shade and constant moisture as well as perfect drainage. To plant it in average soil, or in full sunlight, spells certain failure. Some plants from the wilds demand acid soils, others alkaline; some thrive in locations constantly moist, while others enjoy a dry rocky or sandy hilltop; some require a loose friable soil with plenty of humus, while heavy clays seem to suit a different group. Some growers of these native plants include explicit cultural directions in their catalog lists. There are also several books worthy of careful study.

Alkaline or acid soil conditions are readily ascertained with one of the soil testing outfits available today and this is particularly important with wild flowers. Trailing arbutus, chain fern, bunchberry, wood sorrel, goldthread, pitcher plant, and the twin flower are among those which demand extremely acid soils. Many others like soil which is slightly acid. Average soils may be made acid by the semi-annual addition of aluminum sulphate. The suggested method of application is to sprinkle the crystals evenly over the ground at the rate of about one-half pound to the square yard and water in thoroughly. By all means make soil tests before attempting to establish any considerable plant-

LOVELY AND FRAGRANT TRAILING ARBUTUS
Grown successfully in the wild garden it becomes a treasured though modest member of the plant group

JACK-IN-THE-PULPIT IN THE WILD
Always one of the most interesting and attractive wild plants, it can be made to thrive in the home garden if treated properly

ing of wild flowers. Otherwise you are experimenting blindly. Another method of supplying suitable soil is to bring the prescribed kind in from the woods and make pockets of it where wanted.

A few years ago little authentic cultural information was available about wild flowers, but thanks to the studies and observations of such gardeners as Herbert Durand and the books he has written—*Wild Flowers and Ferns* and *My Wild Flower Garden*—we need not be without guidance.

The establishment of a wild flower garden or sanctuary is most worthwhile in these days when our native flora seems doomed to oblivion. The automobile and far-flung good roads carry millions out into the country. As a result of thoughtless flower picking and the constant spread of urban development, tremendous areas are becoming entirely depleted of most wild flowers. The good work carried on by the garden clubs and wild flower preservation organizations to save them is of no small value, but in spite of their untiring efforts most sections within twenty-five to fifty miles of our cities are almost completely stripped of wild flowers. So we who love their modest blooms and look forward to their appearance in the early spring and throughout the year have but one alternative left, and this is to grow them ourselves.

Those fortunate enough to live in the suburbs where garden space is ample can readily adapt certain areas to these children of the wilds. Even the city garden can make many of them feel at home if their wants are sufficiently understood. An ideal location for a wild garden is a thinly-wooded ravine with open glades here and there. If the ravine boasts a tiny stream of water which may be dammed to form a pool with miniature cascades, then we have the ultimate in location. Such spots are seldom available but many times they may be approximated by careful planning. It is entirely practical, though a large and probably expensive undertaking, to grade the level lot into an unlevel one and produce your own ravine.

PHOTOGRAPH BY KILROY HARRIS

BUNCHBERRY GIVES A SPOT OF COLOR
It is one of those wild plants which requires a distinctly acid soil to prosper in the garden

Among the prime reasons for maintaining a wild garden is that we may preserve and perpetuate as well as enjoy these fast disappearing gems of the floral world. How then shall we obtain plants for our gardens without robbing the wilds of the very things we would forbid others to take? A large variety of these wild plants are available from nurseries and plantsmen who

make a specialty of their propagation. Nursery grown specimens are far superior to collected plants, and as a general rule we should avoid purchase of collected material. They may have been ruthlessly gathered. There are many varieties which should never be dug from their native homes, not only because of their increasing scarcity but by reason of the great difficulty to transplant them successfully. Other less difficult and more plentiful species may be collected in moderation, using care never to take but a few plants from any one spot. Also, you should be certain before digging a plant from the wilds that you can make it comfortable in your garden. Literally millions of plants are dug and carried home only to perish because they are not cared for properly.

There are some varieties of wild flowers that should never be picked, much less dug up. The following need protection —anemone, arbutus, azalea, bloodroot, bird's foot violet, cardinal-flower, columbine, Virginia cowslip, dog-tooth violet, dogwood, dutchman's breeches, gentians, hepatica, holly, Jack-in-the-pulpit, laurel, lobelia, magnolia, orchids, pink, rhododendron, spring beauty and white violet. Dealers in numerous sections of the country offer these and many others, some in field-grown clumps and the more difficult kinds as potted plants.

When you dig plants in the woods, carefully wrap them in wet moss and newspaper so that they do not dry out before you can plant them. If you must keep them several days, remove most of the soil, wrap the roots in moss which is barely moist and pack them in an air-tight container. This prevents drying out. Keep them cool, of course.

Soil preparation for the wild garden is not difficult. The compost heap is always of great value because composted soil contains liberal amounts of vegetable matter so important to the health of plants. Humus in the soil not only supplies food elements but aids greatly in the retention of moisture and at the same time permits free drainage of any excess. Humus also aids in keeping the soil cool. Plants in their wild state generally receive a generous mulching of leaves each fall which, as they decay, return to the soil a part of the food elements needed. In our gardens we frequently forget this need of plants and carry our "clean up" campaign too far. When we rake away and burn all plant refuse in the spring, exposing the bare soil around our plants, we may be making the place look better but we are robbing the plants and exposing them unnecessarily.

As a general thing fertilizers are not needed by wild flowers. Their constitutions are such that they thrive without excess foods, and overfeeding means disease and other pests.

A wild flower sanctuary can easily become one of the most enjoyable phases of one's landscape. To secure the best effects we should avoid associating floral gems from the wilds with shrubs that are obviously far from being wild. Sumac, dogwood, bayberry, elder and witch hazel are much more at home with wild flowers than French lilacs, bridal wreath, boxwood and Japan quince. Wild rhododendron and azaleas are more desirable than their improved hybrid forms. There is a wide variety of native trees and shrubs and the artistic success of a wild flower sanctuary depends largely upon proper association. Trailing arbutus would still be beautiful in the shade of a

PHOTOGRAPH C. W. JOHNSON

THE SHOWY LADYSLIPPER

This is one wild flower that should be given the greatest of protection

THE HEPATICA IN BUD

Another wild flower that requires protection in the face of careless gathering

PHOTOGRAPH A. BROOKER KLUGH

garage, but peeping out from beneath a clump of maple-leaf viburnum its beauty is enhanced many fold.

The wild flower garden may well become a bird sanctuary. By adding a few berry-bearing shrubs to our background plantings we can attract a large variety of birds. Red cedar, dogwood, choke cherry, mulberry, elder and a score of other shrubs and small trees prove great attractions for them. Bird houses and shelters of many descriptions as well as a bird bath will encourage them to make their homes with us.

It would hardly do to end this plea for the home garden wild flower sanctuary without mention of rock gardens. Far too many of our rock gardens entirely ignore the vast wealth of native flora available for their beautification. We welcome gaudy specimens from the far corners of the globe and overlook many charming things from our own mountain sides. If we would restrict our rock garden plantings to plants which are one hundred percent suitable and at the same time be on the lookout for native material, more rock gardens would have a natural look rather than the artificial effect so prevalent today. The rock garden is an ideal adjunct to the wild flower sanctuary and many choice things from hill and mountain side are more at home among rocks than under any other planting conditions. But whatever way you use rocks, try to avoid artificial effects. Too many rock gardens are merely rock piles and anything but a credit to the garden. Thoughtful planning is the key to a good garden.

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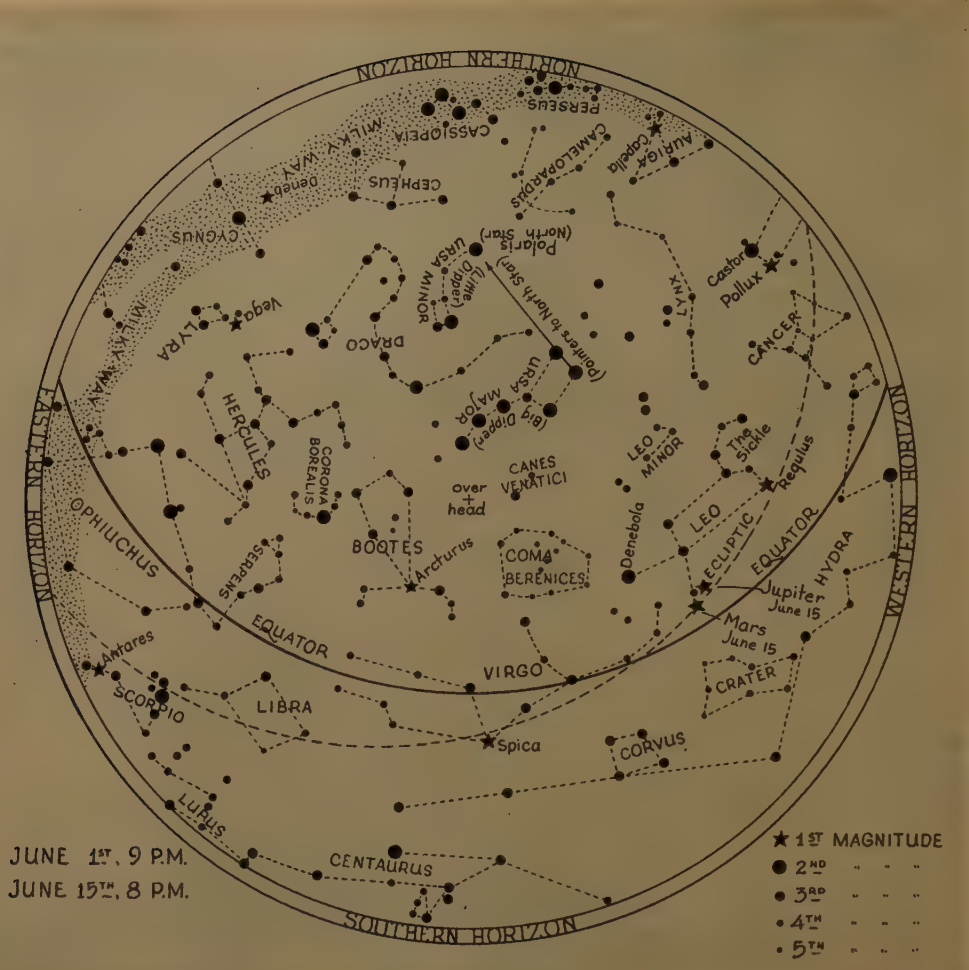
OPOSSUM'S COMEBACK

BY LEWIS WAYNE WALKER

AGES ago, queer members of the family known as marsupials roamed the world. Gradually, however, they disappeared over most of their territory, existing to the present day only in Australia, Central America, and eastern North America. In most places they are becoming rarer due to unbridled persecution. But in at least one section it can be said that they are really increasing, and that, strangely enough, is on the coast of California, a spot where marsupials have been unrepresented since the ice age.

OPOSSUMS LIKE CALIFORNIA'S CLIMATE
Introduced by a fur farmer who failed, they have prospered on the coast and extended their range over a considerable area in California and are increasing

Although a slow animal to all appearances, they have spread unbelievably since their introduction at Visalia, California, a score of years ago. A man from South Carolina decided at that time to raise opossums as fur-bearers, but, after several years of dismal failure, a half-dozen of the animals either escaped or were turned loose to shift for themselves. For several years they were practically unreported, only occasionally being seen. Then their journey started. Ten years later isolated families were found thirty miles from the spot of introduction; fifteen years later fifty or sixty miles away, and so on southward. Soon after the San Diego Zoo opened its doors in 1922, a mother opossum carrying several young in her pouch was brought in from San Clemente, some sixty miles away from San Diego. Two or three years later one came in from forty miles away from the Zoo. The next year one came from thirty. In 1931 they came from La Jolla, then from Point Loma, the point of land that can be seen from the Zoo gardens. In 1932 one was caught within five blocks from the heart of San Diego, while many others were picked up around San Diego's border. From all appearances it seems that these strange animals like southern California as a home. Perhaps the citrus trees have something to do with this selection of a habitat, and although I should not say it —being a Californian— perhaps it's the climate. Whatever the cause, and whether for better or worse, there is no doubt but that opossums are here to stay, and must be from now on classed as another member of California's varied fauna. And they are not the first Easterners, either.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

BEACONS OF THE SUMMER SKY

BY ISABEL M. LEWIS

NEARLY everyone who knows the Big Dipper is familiar with the method of finding the direction of true north, using the Pointers, the two stars in the bowl of the Dipper farthest from the handle. If a line drawn through these two stars is extended upward from the bowl for a distance about equal in length to that of the Dipper it will come to Polaris, the North Star, which lies within about one degree of the north pole of the heavens. When we face this star we are facing due north, east is to our right hand and west to the left. This time-honored method of orienting ourselves at night by means of the North Star is as well known as that of finding the south point by means of a watch and the sun by day.

The Pole-star is a star of the second magnitude at the end of the handle of the Little Dipper. It is easily found with the aid of the Pointers because there is no other star in its immediate vicinity as bright. It lies about midway between the two constellations of Ursa Major, to which the Big Dipper belongs, and Cassiopeia with its very distinctive W. In latitude forty degrees north, the Big Dipper never sets, so we can find the North Star with the aid of the Pointers at any hour of the night. The Big Dipper makes one complete revolution around the north pole every twenty-four hours, while the earth has completed one turn on its axis in the same time.

If one is fairly well acquainted with a few of the most familiar constellations, however, he need not rely entirely upon the North Star and the Pointers of the Big Dipper to get his bearings on a starry night. There are many beacons of the sky that shine brilliantly on clear summer nights to guide us by their friendly rays. If one knows the relative positions of several stars of first magnitude and the constellations to which they belong, that is all that is needed to fix the points of the compass. The stars, like the sun, rise in the east and pass across the heavens

from east to west disappearing finally below the western horizon except in the case of the circumpolar, or "around the Pole" constellations in the northern part of the heavens. These include Cassiopeia, Cepheus, Draco and the Big Dipper in Ursa Major, and they swing around the pole in the east to west direction once every twenty-four hours without ever dipping below the horizon in mid-latitudes of the northern hemisphere.

The other constellations rise and set every day and the farther north is a star in one of these constellations, the longer it is above the horizon and the greater is the arc that it passes over while above the horizon. One soon learns to distinguish the constellations that lie far north from those that appear in the south, and also one soon learns which constellations precede or lie westward of other neighboring groups in this nightly parade of constellations from east to west. Let us turn, for example, to the southern skies in June.

Far over in the southeast in the evening is the constellation of Scorpio. The Scorpion is now rising, its fiery-red first magnitude star Antares serving as one of the most brilliant beacons of the sky for this time of year and, in fact, for several months to come. Everyone should be well-acquainted with this brilliant and oddly-shaped constellation which, in our latitudes, lies always far to the south, and is one of the most valuable aids that we have in getting our bearings at night. The tail of the Scorpion is outlined by a long curved line of brilliant stars trailing eastward and downward toward the southern horizon. Antares rises about nine P. M. in latitude forty degrees north on June 1. Clouds may hide the Big Dipper and the Pointers, but Scorpio in the south, once we are familiar with its form, will serve us quite as well, especially if we consider it in relation to nearby constellations. A considerable distance west of Scorpio is another star of first magnitude that we should know well at this time of year. It is Spica, bluish-white in color, and found in the large, straggling constellation of Virgo. This star also is far south in our latitudes. We might connect it, for the purpose of establishing directions, with that compact little group of stars in the far south known as Corvus. Spica follows Corvus from east to west lying a little north of it as well as to the east. Here, then, in the southern sky at this time of year we have two bright stars—Antares and Spica—strongly contrasting in color, and two very distinctive and different constellations—Scorpio and Corvus—that will establish for us the position of the southern portion of the night sky and the east to west direction, and serve to orient us quite as satisfactorily as the Pole-star and the Pointers.

There are a few other constellations in summer evening skies that we should not fail to know. Leo, in the western sky, its distinctive Sickle open toward the west, will not remain with us in the evening skies for much more than a month because it is drawing toward the western horizon and the rays of the setting sun. But looking eastward we find several beacons among the brightest stars and these will be with us throughout the summer and well into the fall. Conspicuous among these are Arcturus, in the kite-shaped constellation of Bootes, and Vega, in the beautiful and easily-recognized little constellation of Lyra, the Harp. These two stars are almost exactly equal in brightness but very different in color. Arcturus is usually referred to as orange in color, Vega as diamond-like, a beautiful and brilliant bluish-white, one of the finest stars of the northern hemisphere. Vega follows Arcturus across the sky in the east to west direction at some distance to the north as well as east. Directly east of Bootes is one of the most interesting and easily identified little groups in the sky, the nearly perfect little semicircle of stars known as Corona Borealis. The brightest star, the gem in the crown, is the third magnitude star Gamma or Alphacca. South of Corona Borealis is the long line of stars running first nearly due north and south and then turning sharply eastward. This is known as Serpens, the Serpent. The Pole-star, the bowl of the Little Dipper, with a few stars in Draco, intervene between this group and Corona. Serpens and the western part of the constellation of Scorpio lie nearly in a due north and south direction.

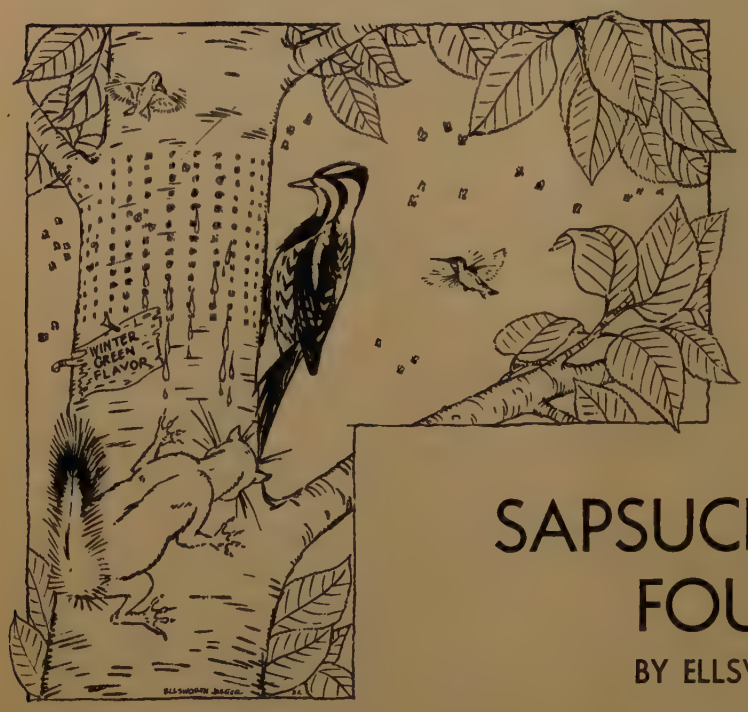
We might select other constellations and show how their positions relative to neighboring groups show direction, but we leave the reader to find other beacons of the sky for himself. Ability to recognize a few of the most distinctive and easily-identified groups is all that is necessary to enable one to become quite expert in steering by the stars.

Constellations come and go with the seasons, but the change is so slow and gradual that the same groups remain above the horizon for weeks, or months in some cases, while, as we have said, the circumpolar groups never pass below the horizon. As the westward shift of the constellations from night to night causes the constellations farthest west to disappear eventually in the rays of the sun, other constellations come into view above the eastern horizon until the yearly circuit of the heavens has been completed and the panorama repeats itself in the course of another year.

In June's evening skies we find that Leo is drifting toward the western horizon, although still quite high in the west in the early evening. Far over in the east the first magnitude star Altair, in the constellation of Aquila, the Eagle, will soon be coming into view. Scorpio, rising about nine P. M. in the southeast the first of June, will be visible throughout the summer and early fall.

The story has been often told of the prisoner who escaped from the enemy's country during the World War by travelling at night through unfamiliar territory with only the stars to guide him, hiding by day. Though those days are fortunately over we will always find these friendly beacons of great service to us if we chance to be uncertain of our bearings at night. A little practice will soon make one expert in orienting himself at night by means of the stars and will at the same time bring a familiarity with the constellations that will be a source of pleasure that will remain with one through life.

Summer will begin this (Continued on page 308)



• • •

Uncle Dick's Department has been in Nature Magazine for a year now—my, how time flies! It has had a lot of different kinds of stories in it. If you like what has been in it, drop Uncle Dick a note. If you don't like it, write him a letter and tell him what you would like. He wants to know.

• • •

SAPSUCKER'S SODA FOUNTAIN

BY ELLSWORTH JAEGER

PINK LEMONADE! Fizzing, foaming BIRCH! How familiar this sounds when the circus comes to town, but have you ever seen birch beer signs along a trail in the forest?

Last summer, back of our cabin, we found just such a soda fountain. It was half way up the trunk of a sweet birch tree. Many of the wood folk came to quench their thirst and satisfy their sweet tooth.

The soda fountain clerk was a sapsucker who hammered away into the trunk of the tree, tapping a new source of supply every little while. He did this very neatly and judging from the looks of his work, he must have used the measuring worm. Each little hole was equally spaced from the other.

Of course he was after insects, but the job was evidently a thirsty one because every now and then he would take a sip.

Other woods people however, had found this forest refreshment stand and there was a continual coming and going of the various tribes. Bees came from all directions. It was they, perhaps, who had passed on the word of this new sweets shop where everything could be had for the taking.

Now and then a louder hum would be heard and that brilliant green jewel with a ruby at his throat, the humming bird, would rocket into view. He evidently is of a temper none too certain because he would attack any of the other folk whom he thought were trespassing. Even sapsucker was very nervous when hummer was around and he would duck around the tree trunk for safety. It made me think of the stories of the bold, bad men of the old West who would frighten everyone under the tables when they came swaggering into the hotels, a gun in each hand.

The hum, from which the humming bird gets his name, is made by the wings, which move faster than an airplane propellor. He can easily travel sixty miles an hour and is the only bird who has reverse gear; that is, he can fly backward. He is also one of the few birds who can rise straight into the air like a helicopter.

He has a weak squeak for a voice and feeds largely on insects which he generally catches on flowers, but he does not hesitate to sip the nectar of flowers as well. The humming bird's nest is so tiny it is seldom noticed and is made of plant down bound together with spider webs and covered with lichens, the whole being most skillfully attached to a branch.

Another patron of the Sweets Shop was a red squirrel, who never hesitated to tell people just what he thought of them. He was most impolite for he would rush at other customers and drive them away with an explosion of squirrel words. Occasionally another red squirrel would be there

ahead of him and this always ended in a fight. The two sometimes tumbling to the ground in battle.

Of course there were other visitors, some who came perhaps after dark but they were quiet, unassuming folk, and so did not get into the headlines, which is so often the case with animals.

• • •

A HAWK BASEBALL FAN

BY TOM WALLACE

WE NEVER had any idea why Quo-Quo liked baseball better than other outdoor sports. But he did prefer it, and he left no doubt about it.

But let's begin at the beginning. Quo-Quo, whose real name was Quo Vadis, was the smaller of two baby sparrow hawks. Some boys, one of them my son, picked them up when they —the boys—were on their way to a creek to fish. The hawks must have fallen from a nest. They were helpless and too young to fly.

"Them's chicken hawks. Let's pull their heads off'n 'em", said one of the boys. This boy had the silly idea that all wild life is in some way hurtful to the farmer. He did not know how much good birds do in eating insects and mice.

The heads of the hawks were *not* pulled off. A fight among the boys was avoided, and a quarter satisfied the boy who had discovered the birds. So they came home to us.

The larger, less bobtailed, and more beautiful of the two hawks soon learned to fly, and left us. Not so with little Quo Vadis. The Senorita—that's daughter—named him that because he never seemed to know where he was trying to go, and he took no interest in flying. He was as ready to fight as he was to eat, and did a good deal of both when he got the chance. He wanted to fight Jeb, the wire haired fox terrier, but we did not think it safe for Quo-Quo. Because he could not help himself or fly, Senorita became his personal maid. Less fighting resulted.

When it was time for camp Quo-Quo still had not learned to fly. He seemed much behindhanded about the matter. He didn't seem to care to fly. So we got a permit, and —off went the Senorita—with Quo-Quo in the gilded cage Billy, the green parrot, left when he died. Off they went to Camp Trail's End, on the Kentucky River between Lexington and Richmond. That is nearly one hundred miles from where Quo-Quo lived when he disobeyed his parents and tumbled out of the nest.

At Trail's End Quo-Quo became the pet of the camp, and liked it. He was not kept in the cage. He had the freedom of the camp. There he learned to fly. Sometimes he would go away and stay for a day or two, and the girls would believe him a deserter. But he always came back, and let out a loud shout, or a lot of them. Then he sat about on low limbs, or on the porch railing, or elsewhere, and gobbled food. He was a good hunter and filled himself with grasshoppers and other insects.

It was soon found that when the girls played baseball Quo-Quo, somewhere in the surrounding forest, heard the noise and came and sat on a swinging limb near the home plate and enjoyed the game. Often he added his voice to the general uproar when the game got exciting. Every time baseball was played Quo-Quo came into camp. If it rained, and there wasn't any baseball game, he did not always return. He may have liked the shouting, and the sharp report as the bat hit the

ball. He was a quiet fan and did not jump about.

When I went to camp the day of the pageant, late in August, there had been no baseball for a couple of days. And there had been no Quo-Quo.

"He'll be around when the ball game begins", said the girls. I didn't believe it, and said so. Sure enough, when the game started a tiny shadow fell upon the diamond. It was Quo-Quo passing between the turf and the sun to his perch on the home plate limb. Maybe you can't believe it, but it is true.

"Well, bring Quo-Quo home, if you can catch him", I called to the Senorita, as we set out for home after the pageant.

A few days later the Senorita came home without Quo-Quo. She had caught him and put him in his cage, much to his disgust. But she tripped and fell, walking to her tent. The cage was dropped. The bottom fell out and Quo-Quo flew away. There were notes in his voice, the Senorita said, which sounded like a laugh—a horse laugh.

"Sallie will get him for me", said the Senorita.

I didn't believe she could do it, but three weeks after the camp was closed Miss Sarah Blanding, counselor at camp, called, and—you may ask her if you don't believe me—Quo-Quo was in a box.

She had gone over to camp and lured Quo-Quo from a limb with a little hunk of meat. And there he was, looking disgusted.

And that is how Quo-Quo got back to the farm, where there isn't any baseball. It must seem dull, to a fan.

• • •

COTTON-TAIL CLOUDS

BY FLORENCE H. MOORE

You don't suppose, do you,
That the Bunnies lost their tails,
And changed them into cotton-clouds
With fluffy, little sails?

Bunny seems somewhat in doubt,
As he sits beside a tree,
Trying hard to look around,
For his tail he cannot see.

But some friends are near,
And they're hastening to say,
That poor Bunny's cotton-tail,
Is really on to stay.

PUZZLE: *Find Bunny's friends, Hiram, the Rooster, and Debby, the Cat.*

• • •

THE CROWNED CRANE

THE CROWNED cranes, whose heads appear in color on the cover of this issue, are birds of Africa only. They are among the most beautiful of all the cranes, and are quite easy to obtain and readily tamed. The Dutch of South Africa call them "mahem" from the sound of the last part of their trumpeted call.

They become much attached to their homes and can safely be given full liberty. They serve their human friends well by eating all kinds of insects, and lizards, frogs, snakes and snails.

The species pictured is from Northern Africa. Scientists call it *Balaerica pavonina, L.* It differs mainly from the southern form *(regulorum)* in having the cheek colors reversed. The northern form is quite rare in captivity, while the southern form, the "mahem", is often kept along with the barnyard chickens.

Normally they inhabit the swamps and low grass lands, nesting in the boggy spots on conical mounds of reeds and rushes pulled together by the females. Not more than two eggs are laid.

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GARDENS AND GARDENING

Edited by
ROMAINE B. WARE

May and June are months of fruition in the well planned garden. Borders should be gay with the last of the narcissuses; tulips reach the height of their show; the main display of irises takes place now, and, of course, in June, the garden reaches its climax. June in the perennial garden is the culmination, the zenith of the spring show. From the moment Jack Frost is routed by spring sunshine and the blossom parade begins, there is a constant unfoldment, a constant succession of climaxes reaching their height as the peonies, roses, delphiniums and a host of other gems mature. June is truly a yard stick by which one can measure gardening ability.

June, too, is a busy month with the work-a-day gardener, especially if he is looking forward to better results in years to come. It may seem far-fetched to start planning for fall planting at this early date, but that is just what up-and-coming gardeners must do. The best time to choose the new things you will plant is during their season of bloom, and two of the most important just now are tulips and tall bearded iris. Tulips, of course, are not planted until late in the fall, but now is the time to select them. Many dealers offer special prices upon orders placed before July 15 and, besides, early orders always get the cream of the stocks. Probably the greatest advantage to the average gardeners is that by studying tulips during their blooming season one can more easily select desirable kinds. So I would urge you, if possible, to visit tulip show gardens or any other plantings available and choose the kinds to your liking.

The same suggestion applies to iris. Right now, while the blooming season is at the height, you will find it easiest to select new kinds. In almost every section of the country there are growers, and many iris shows are held. Recent years have seen tremendous improvement in this family of hardy flowers, that no matter if you have irises in your garden, you will want some of the new ones. We now have pink irises that are really pink and reds that are red. If you are not familiar with these newer irises, send for some of the catalogs and you will find many worthy of a place in your garden. Some iris specialists issue elaborate brochures with natural color plates and while they charge a nominal sum for them these catalogs are more than worth the price.

It was my privilege to attend the big spring flower shows in Boston, New York and Philadelphia, and, judging from the extreme high quality of the exhibits and the tremendous interest shown, gardening seems to be well in the vanguard of the return to normalcy. The attendance broke all records in spite of bank holidays. Not only were the individual exhibits beautiful and interesting but many were of such nature that observing gardeners gleaned from them ideas of great value in planting and planning their gardens.

Outstanding at the Boston show was an exquisite rock garden, perfect in detail, restrained in planting and perfectly natural in general effect. Such gardens are truly an inspiration to gardeners. Another exception-

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ally well done feature was the village street by the Garden Clubs, with attractive roadside stands, well-planted filling stations, yards and gardens. The New York show had so many gorgeous displays that it is difficult to mention individual specimens. The bulb gardens were wonderful, as also were the azaleas. Never were finer delphiniums shown. Outstanding both in quality and interest created were the Garden Club exhibits and their allied educational features. The great advance in this phase of flower exhibitions is most gratifying as it is the result of effort and thought by many amateur gardeners.

At Philadelphia the bulb gardens, rose garden and azalea gardens were exceptionally fine. Many of them were designed in such manner that home gardens could utilize the ideas presented. Orchids were prominent at all shows with extreme interest shown at Philadelphia in a well done display of these gems arranged in a natural setting. At all the shows a most interesting selection of garden equipment, tools, insecticides and gadgets of various kinds was shown. Practical gardeners are greatly interested in such displays. Visiting with the salesmen and demonstrators is one of the educational phases of the shows.

This season, when prices are being slaughtered on all sides, the experienced gardener is shopping carefully because not all plants offered at bargain prices are truly bargains. With the falling off of business some growers have been compelled to neglect the transplanting and root pruning which is absolutely necessary to produce quality plants and roots. Others have neglected pruning top growth and poor misshapen specimens are the result. We are all anxious to secure our plants at reasonable prices but poorly grown stuff is costly at any price and the mortality is very high where poor root systems abound.

Earlier this spring these columns mentioned some of the new developments among chrysanthemums. Recently I learned of a new hybrid of the Korean chrysanthemum called "Mercury", offered for the first time this spring. It is a single of large size, oxblood red suffused with copper in color and extremely hardy; a good keeper and differs from most 'mums in having a delightfully sweet fragrance. This new 'mum, Mercury, is protected under plant patent #58 and would seem to be worth adding to one's garden.

Don't starve your garden. Plants need food the same as we do. The kind of food we give them will depend upon many conditions. Annual flowers need foods that will nourish them promptly, perennials call for foods to last over long periods. Almost all plants need more humus in the soil to break it up, to encourage bacterial action so necessary to the assimilation of all plant foods. Well-rotted barn yard manures are considered by many as the best but in this day and age they are very scarce. Commercial fertilizers are useful and come in a wide variety. For all around garden use, one of the safest foods is bone meal. Steamed bone meal is reasonably quick acting but raw bone meal does not become available for several months after applying. Bone flour, being very finely pulverized, acts more swiftly. You should try out other plant foods as many of them are excellent. Plant foods are quite a study and you will find it most interesting.

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are developed to help the gardener. We now have perfected electric hedge shears that take the labor out of this task and electric insect lures that rid the garden of all night flying pests. A new liquid weed killer is offered this year called Weed-Tox, a drop or two of which will completely kill weeds, root and all, without harming surrounding plants. Electric hot bed heaters are becoming more perfect and quite reasonable in price. Devices are now available for watering tree roots two or three feet below the surface. Mechanical soil preparation is possible with one operation where two or more were necessary in the past. Small greenhouses are becoming practical and obtainable at reasonable prices. In fact home gardening is becoming easier and more interesting all the time.

Soil conditioning is receiving more attention as evidenced by the greater appreciation of peat moss. Once a gardener really understands the tremendous value of using peat liberally in the garden, he is well on the road to success. Practically all soils are improved by mixing peat into them, and surprising results are obtained with new plantings of shrubs and trees as well as other kinds of plant material when peat is liberally added to the soil around the roots. Combinations of manure and peat have limitless possibilities.

There is still plenty of time to plant gladiolus, dahlias and chrysanthemums. In fact with glads and 'mums, the next few weeks are the best season and dahlias can be set out any time within a month or more. By all means plant some additional varieties and learn the joy of looking forward to something absolutely new blooming in your garden this season. The joys of anticipation are almost as great as those of realization and gardeners may enjoy both of them. Don't drift along with the same old things in your garden year after year when for the expenditure of just a few dollars you can enjoy the thrill of new things. There are few hobbies that pay such dividends as gardening. I do not question the fascination of other hobbies but once you become garden-minded, you truly begin to live. Just ask the man or woman who's tried it.

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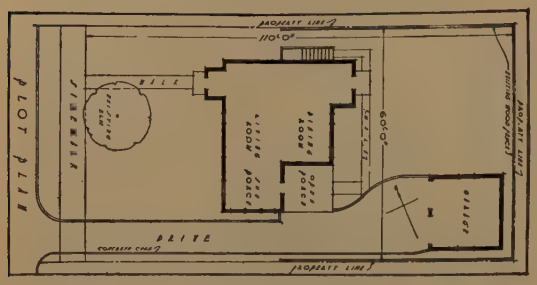

Rough sketch of plot plan as originally presented showing features needed.

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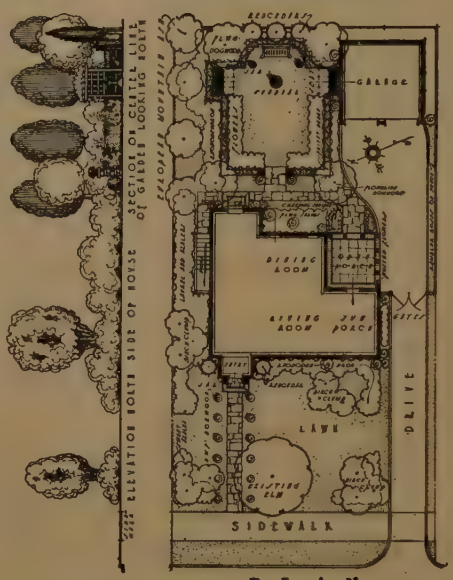

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A plot plan of your property similar to the rough sketch above, if possible indicating existence of slopes and their extent.

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Locate house on plot plan showing existing walks, drives, trees, shrubs, etc.

Locate windows and doors on first floor. You may send blue prints if you wish.

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State special features desired such as—

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Children's play yard
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Water pools
Formal gardens
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Indicate on plot plan North and South points of property.

Advise type of soil—sand, clay or loam.

Show street curb and sidewalk, as well as street trees, if any.

State type of planting material preferred—shrubs, trees, evergreens, etc.

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THE BEAVER OF KILLISNOO

(Continued from page 288)

was so odorous. Suddenly the Chinook changed to a high, strong wind which made the trees bend low and lashed the waves mountain high. The sky changed rapidly from deep blue to blackish green. The black storm clouds swept from off the water in solid formation. The wind grew stronger. Then, with a great blast, it struck the land, sweeping, whirling and leveling all before it.

The Indians gathered to view the spectacle. They were on their house platforms when the beaver started to sing his farewell song. He had just finished as the storm broke. He slapped the water with his tail, making a dreadful sound like thunder, and then dived.

Simultaneously with the slap and the first big blast of wind, the weakened foundations of the town gave way and before the natives had an inkling of the meaning of the beaver's song the town was in the hole excavated by the beaver and the angry waves swished around it, cutting off all escape of the luckless natives.

There were few survivors, but enough to repeat the beaver's song. To this day the tribe sings it when they mourn their dead. Their children are taught to respect the beaver, and the beaver emblem is carved on their totem poles.

BEACONS OF THE SUMMER SKY

(Continued from page 301)

year on June 21 at 4:12 P. M. Eastern Time. Then the sun will reach its greatest northern declination, that is its greatest distance north of the equator. The sun then enters the sign of Cancer although, because of the precession of the equinoxes, the sign no longer coincides with the constellation of the same name, so that at the beginning of summer the sun is in the constellation of Gemini instead of Cancer.

The planet Jupiter will be in quadrature with the sun on June 5, when it will be due south at sunset in the constellation of Leo. Mars, also, will be in quadrature with the sun this month, a day later than Jupiter. The two planets will be in conjunction on June 4, when Mars will be south of Jupiter and so close to it that the two will appear almost like a double star. Mars is now receding from the earth and decreasing in brightness. These two planets have been conspicuous for many weeks in Leo. Mars passes into Virgo about June 20. It is interesting to note the change in the positions of these two planets relative to each other at this time. Jupiter is now far superior to Mars in brightness. Venus is now an Evening Star but is still low in the west, setting about an hour after the sun the middle of the month. Saturn is also in the evening sky but does not rise until nearly eleven o'clock on June 15, appearing in the southeast in Capricornus.

Mercury is too close to the sun to be visible early in June. It will be at its greatest distance east of the sun the second of July, so may be seen low in the west in the evening twilight the last few days of June.

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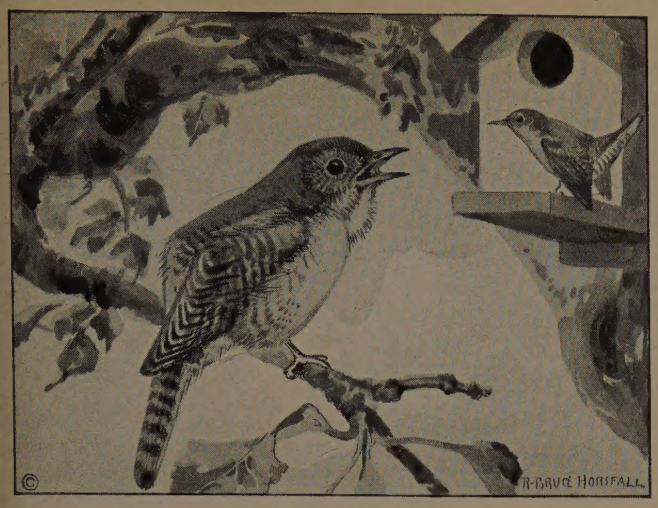

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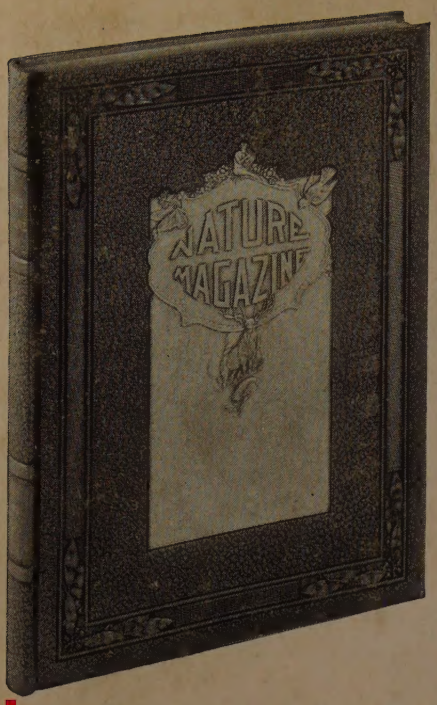

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